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THE

**JOURNAL**

OF

**THE ASIATIC SOCIETY**

OF

**BENGAL.**

—

**VOL. I.**

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THE  
**JOURNAL**  
OF  
**THE ASIATIC SOCIETY**  
OF  
✓  
**BENGAL.**

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EDITED BY

JAMES PRINSEP, F. R. S.

SECRETARY OF THE PHYSICAL CLASS, ASIATIC SOCIETY.

—  
VOL. I.  
—

JANUARY TO DECEMBER,

**1832.**  
—

“It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta; it will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease.”

SIR WM. JONES.

—  
**Calcutta :**

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**1832.**





TO  
**CAPTAIN JAMES D. HERBERT,**  
**Bengal Infantry,**

LATE

DEPUTY SURVEYOR GENERAL OF BENGAL, AND SUPERINTENDENT  
OF REVENUE SURVEYS;

AT PRESENT HOLDING THE APPOINTMENT OF  
ASTRONOMER TO HIS MAJESTY

**The King of Oude:**

WHOSE JUDGMENT ORIGINATED; WHOSE PERSEVERANCE AND EXERTIONS SUCCESSFULLY  
ESTABLISHED; AND WHOSE SUPERIOR ABILITIES SUPPORTED FOR 3 YEARS,

THE FIRST JOURNAL

IN INDIA

DEVOTED TO THE EXCLUSIVE PUBLICATION

OF

**GLEANINGS IN SCIENCE;**

THIS VOLUME,

IN ALL RESPECTS, BUT TITLE, A CONTINUATION OF HIS OWN WORK,

IS

**Inscribed,**

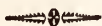
BY HIS ATTACHED FRIEND,

**THE EDITOR.**

CALCUTTA, }  
*January 1, 1833.* }



## PREFACE.



THE ASIATIC SOCIETY, on the 7th March, 1832\*, passed a resolution, that the monthly journal hitherto published under the name of "GLEANINGS IN SCIENCE," should be permitted to assume that of JOURNAL OF THE ASIATIC SOCIETY, and to continue it as long as the publication remains under the charge of one or both of the Secretaries of the Society. This privilege has, as it was anticipated, been the means of extending very considerably its circulation, while it has given a character and authenticity to the work, by its connection with an institution of established literary reputation, which no anonymous magazine, however well conducted, could hope to command.

The advantages of extended circulation have reacted to the benefit of subscribers, by enabling the Editor to increase the quantity of letter press from 400 to nearly 600 pages; and yet so constant has been the growing support of its contributors, that the pages of THE JOURNAL have been devoted, with few exceptions, to the insertion of original communications.

To many readers it would doubtless have been preferable that THE JOURNAL should contain more copious extracts from English scientific periodicals, which are not procurable in the interior of India; but conceding that, as an organ of Indian scientific intelligence, it must obviously derive its only merit among the many similar periodicals of the present day, from its stores of *oriental* literary and physical research, it will be generally acknowledged, that the first object of the work should be to give publicity to such oriental matter as the antiquarian, the linguist, the traveller, and the naturalist may glean, in the ample field open to their industry in this part of the world. While acting

\* The January number was not published until the middle of March.— Since then exertions have been made to bring up arrears, and in future each monthly number will appear with regularity on the 10th of the following month; the insertion of the meteorological register rendering an earlier issue impossible.

on this principle, however, the Editor has not lost sight of the great utility of following, as far as means would permit, the progress of the various sciences at home, especially such as are connected in any way with Asia; the only limits thereto being want of space, and want of time to peruse and extract from the vast number of publications of the present day. Want of room also precluded the possibility of republishing the proceedings of the Medical and of the Horticultural Societies; but this had become less urgent since both of those useful bodies adopted the excellent rule of giving early publicity to their own proceedings and records.

To the Asiatic Society THE JOURNAL has naturally looked for its most frequent and interesting communications; and in consequence of its more intimate connection with that Institution, the proceedings of that body have been given in greater detail than heretofore, so that absent members may learn exactly what passes at its meetings, and what accessions are made from time to time to its library and its museum. Many absent members have complained of the quarterly subscriptions they were heretofore called upon to pay, while they remained in ignorance of what was going forward; this source of objection is now obviated, and perhaps a still greater amendment may yet be effected for their benefit, by an arrangement that all members of the Society shall receive a copy of the Journal gratis, which will reduce their annual payments nearly one fourth.

It is unnecessary to recapitulate the contents of the present volume, or to allude in anonymous praise to those who have favored its pages with their assistance; since the authors have, in most cases, on suggestion, permitted their writings to be authenticated by the insertion of their names, as should always be the case in matters of fact, observation, and research. One illustrious name however must not be passed over without a tribute of gratitude for its valued and frequent contributions, a tribute more sincerely paid, since India has now lost the power and the claim to their continuance; she has resigned her most eminent oriental scholar to climes where his talents may find more genial appreciation, but where they cannot excite more respect or admiration, than they will ever command in the land which called forth their energies and directed their application.

The learned Societies at home will be proud to publish the continuation of the *Analyses of the Puránas*, of which the four first have appeared in these pages. Abstracts of four only were ready for the press, but translations of the remainder of the eighteen *Puránas* themselves had been completed under the superintendence of Professor Wilson, before he quitted India.

Mr. Alexander Csoma's indefatigable labour, in opening to us a first acquaintance with the literature of Tibet, will be estimated as it deserves by literary men—a contracted circle perhaps, because deep erudition and study are requisite to form critics capable of appreciating the nature and bearing of his peculiar researches upon the history, languages, and religions of other nations, both ancient and modern. All may however feel sensible of the devotion, zeal, and perseverance, which are necessary to lead a man, alone and unpaid, into a distant and wild country, to learn its language, and study its people at the fountain head. The volumes of notes which Mr. Csoma has presented to the Asiatic Society, will, it is hoped, be published in their Researches at length.

In furtherance of the desire of the Government, the greater part of Dr. Buchanan's Statistics of Dinajpúr has been printed in a detached form, as commenced by the Editor of the *GLEANINGS*; and to complete the work more speedily, two extra numbers have been issued in the course of the year. It will be remarked, that there are many plates referred to in the text: the drawings alluded to are in possession of the Honorable Court of Directors, along with the original manuscripts; it was thought better to preserve the references, in case the Hon'ble Court might hereafter be persuaded to publish them, either in a separate form, or of a size adapted to the present edition. It must not be forgotten, that it is this undertaking which gained to the *GLEANINGS* the valuable privilege of free postage through the Bengal Presidency. The Editor is happy to announce, that the same boon has, in the most liberal manner, and without any solicitation, been extended to the Presidency of Bombay and to the Government of Ceylon, by their enlightened Governors, His Excellency the Earl of CLARE, and the Right Honorable Sir R. W. HORTON, to whom his thanks are thus publicly and respectfully addressed.

To his numerous correspondents, the Editor can but proffer thanks for past, and solicitations for future, support, bidding them remember that, the scope and object of this publication embraces the literature, the manners, the geography, physical and mineral, the arts, the natural productions of Asia, the phenomena of its climate, and observations of the heavens. In the words of the illustrious founder of the Asiatic Society, “ the bounds of its investigation will be the geographical limits of Asia ; and within these limits its inquiries will be extended to whatever is performed by man or produced by nature.”

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*Dedicated, by permission, to*

LADY W. C. BENTINCK,

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A

# TREATISE

ON

## THE MUSIC OF HINDOOSTAN,

COMPRISING A DETAIL OF

## THE ANCIENT THEORY

AND

## MODERN PRACTICE.

---

THE similarity of the music of Egypt and Greece to that of this country has been traced and pointed out : harmony and melody have been compared : and time noticed. The varieties of song have been enumerated, and the character of each detailed : a brief account of the principal Musicians superadded, and the work concluded with a short alphabetical glossary of the most useful musical *Terms*.

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BY

CAPTAIN N. WILLARD,

*Commanding in the Service of H. H. the Nuwab of Banda.*

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*Price to Subscribers, Sa. Rs. 8.*

## PROSPECTUS.

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A TREATISE on the Music of Hindoostan was much wanted. The scanty information obtainable through the channels of Dr. GILCHRIST and Sir WILLIAM JONES, are neither of themselves sufficient to fill this chasm, nor do they elicit light sufficient to enable one to grope through the various obscure writings in the vernacular languages and dialects. The songs set to music by Mr. BIRD and Mr. WALKIER, are of the more modern style, and not of the ancient school; so that, instead of elucidating the theory, they lead us into confusion, when compared with the tables of Rags and Raginees given by Sir W. JONES.

The forthcoming work has been written with the view of describing in some measure, the theory and practice of the original music of Hindoostan, but chiefly to unfold the beauties of which it is susceptible. The extravagant eulogium offered to the music of ancient Greece, and the striking similarity which appeared to the author to exist between that and the subject to be treated of in this work, has led him to point them out, in the hope that, should a taste for the music of this country obtain among the professors of the science in Europe, it might perhaps conduce to the elucidation and revival of a much-desired and lost branch of knowledge, namely, the music of ancient Egypt and Greece.

For this purpose it appeared to the author, that a bare translation of any of the existing native works would not suffice. All who have been taught music are so much accustomed to the European way of explaining it, that every other must necessarily appear uncouth and preposterous. In the arrangement of this work, therefore, the European system has been adopted.

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**PREFACE.** A general view of the plan and contents of the work.

**INTRODUCTION.** Music, Its power on the human mind. That of Hindoostan. The opinion of the Natives with respect to their ancient musicians. How a knowledge of it may be acquired. Not generally liked by Europeans. Reasons assigned for this. Native opinion with regard to its lawfulness. Musical instruments. Relation of music to poetry considered. Progress of music in Hindoostan. The manner of life which should be led to ensure eminence in this science. Cause of its depravity. Date of its decline. The similarity which the music of this country seems to bear to that of Egypt and Greece. How a knowledge of the music of Hindoostan might conduce to a revival of that of those countries. Comparisons offered. Whether the natives of Greece or Hindoostan had made greater progress in music. Comparisons decide in favor of the latter.

**HINDOOSTANEE MUSIC.** What it is termed in the original. The treatises held in the greatest estimation. Native divisions what, and how many. The arrangement adopted in this work.

**OF THE GAMUT.** What it is called. The derivation of the word. The subdivisions of tones. Resemblance of these to the Greek diesis. Opinions of Dr. Burney and Mr. Moore on the enharmonic genus. Names of the seven notes. Origin of these. The gamut invented by Guido and Le Maire. Dr. Pepusch. Srooti.

**OF TIME.** The various measures used in Europe. Difference between them and those of Hindoostan. Their resemblance to the rhythm of the Greeks. Similiarity between the Greek and Sungscrit languages. The Hebrew unmusical, likewise the Arabic. Melody and metre considered. Tartini's objections against metre, endeavoured to be controverted. The dignified prose in Sungscrit, and tongues derived from it. Its superiority to the Oordoo. Probable origin of the modern musical measure. Tartini's deduction of measure from the proportions of the octave and its fifth, opposed to the practice of Hindoostan. Whether the rhythmical or the musical measure possesses greater advantages. Opinion hazarded thereon. Time table. Characters for expressing time. Their varieties.

**OF HARMONY AND MELODY.** The origin of harmony in Europe. Opinions of several learned men on the subject of harmony, with that of the author. Claims of melody.

**OF ORIENTAL MELODY.** Not generally susceptible of harmony. Limited to a certain number. Its character.

**OF RAGS AND RAGINEES.** The general acceptance of the terms supposed to be incorrect. Reasons offered, why they are limited to season and time. Of the Ragmala. Absurdity of limiting tunes to seasons. Divisions of Rags and Raginees into classes. Rules for determining the names of the mixed Raginees. Table of compounded Rags. The Ragmala copiously described.

**OF MUSICAL INSTRUMENTS.** Their present state susceptible of much improvement. Their classification. Detailed description of the several instruments now in use.

**Of the various species of VOCAL COMPOSITIONS of HINDOOSTAN.** Twenty different species described.

**Of the PECULIARITIES of MANNERS and CUSTOMS in HINDOOSTAN,** to which allusions are made in their song. Its characteristic nature. Reasons assigned for several of them, which now no longer exist, and examples produced.

**Brief account of the most celebrated MUSICIANS of HINDOOSTAN.**

**GLOSSARY** of the most useful musical terms.

---

*N. B. The work will be printed on superior English paper, at the Baptist Mission Press, Calcutta.*

Subscriptions will be received by Mr. A. JEWELL, Moorghehuttah, and Messrs. THACKER and Co. St. Andrew's Library.

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## DIRECTIONS TO THE BINDER.

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The sheets of Buchanan's Statistics are to be separated from the monthly numbers. The Plates may either be bound up at the end of the volume, or in the following order :

Hyderabad Bridge, .....	14
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## ERRATA.

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- Page 10 line 9 for "wool," read "wood."  
 — 11 — 7 from bottom, for "plate 1, fig. 2," read "plate 2, fig. 1."  
 — 14 — last line, for "delomite," read "dolomite."  
 — 19 — 16 from bottom, for "3, 4, 5," read "1, 2, 3, 4."  
 — 20 — 8 from top, for "plate 1," read "plate 2."  
 — 20 — 9 for "he protracted," read "the protracted."  
 — — — 11 for "BB' B'," read "B' B'."  
 — — — 16 for "intercepts," read "intersects."

AND

*In Fig 2, plate II. continue the dotted arc  $l'1a''$  to  $a'$ .*

*The line A  $c'$  continue to c.*

- 28 — 7 from top, for "manima," read "minima."  
 — — — at bottom, for "Artesien," read "Artesian."  
 — 33 — 7 for "January," read "February."  
 — 410 — — in last column of Table II. for "2m. 58s. 8," read "0m. 58s. 8."  
 — 46 — 18 from top, after "which" insert "comma."  
 — — — — "either" ditto.  
 — 47 — 2 from top, for "have," read "has."  
 — 57 — 12 for " $99\frac{1}{4}$   $99\frac{1}{2}$   $99\frac{3}{4}$ ," read " $99\frac{1}{4}$   $99\frac{1}{2}$   $99\frac{3}{4}$ ."  
 — 59 — 24 and throughout the article, for "sack," read "sac."  
 — 60 — 4 "orbitar," read "orbital."  
 — — — 10 "interval," read "internal."  
 — — — 29 "lips," read "tips."  
 — — — 34 *dele* "by."  
 — 60 — 15 for "compressed and hard; before," read "compressed and hard before ;"  
 — — — 28 for "lips," read "tips."  
 — 62 — 11 for "this Chiru," read "the Chiru."  
 — 63 — 10 for "bambdoidal," read "lambdoidal."  
 — — — 14 for "malars," read "molars."  
 — 65 — 8 for " $1\frac{1}{8}$ ," read " $\frac{3}{8}$ ."  
 — 67 — 2 from bottom, after "than," read "the."  
 — 74 — 15 for "9," read "9'."  
 — 75 — 21 *dele* "rufous," repeated.  
 — 79 — 17 from bottom, for "done," read "done."  
 — 148 — — foot note, for "Rutboo," read "Kubboo."  
 — 226 1st par. 5th line for "Ekadantashtra," read "Ekadanshtra,"  
 — 226 4th " 4th — for "Kridama," read "Srid'ama"  
 — 229 2nd " 5th — for "Vrishapati," read "Vrihaspati."  
 — 231 — " 3rd — for "Viswaséna" read "Viswakarma."  
 — 238 — — after "Ganges river," insert "at Gházipur."  
 — 245 10 " from bottom, for "it," read "the mirror."  
 — — 1st " 7th — for "He having," read "Having."  
 — 296 line 3 for "but mostly," read "and,—"  
 — — — 7 for "hydrogen. When," read "hydrogen, where."  
 — 305 — 20 for "circumference," read "diameter."  
 — — — 21 for " $27\frac{1}{2}$  rupees," read " $2\frac{1}{2}$  rupees."

*Errata in Meteorological Register, for June.*

	Date	Hour.	Bar.
	13	Sun-rise, for	,365 read ,465
	14	,,	,399 ,499
	22	,,	,517 ,617

Add 0,010 to all the figures in the Barometrical column for 10½ P. M.

— 340 — 6 after "*Rhinolphus*," insert "and two species of *Vespertilio*."

— 355 — 13 for "*ακανσα*," read "*ακανστα*."

— 355 — 2 from bottom, after "*nilam*," insert "*nil mani*, (or *manik*.)"

— 356 — after "College of Fort William," insert "the word *bahrmani* is also used in the *Khawás-ul-ir*, as a variety of the *yaqút*."

— 358 — 20 dele "or a species of garnet."

— 358 — 22 for "*manik*," read *lálri*."

— 403 — 5 from bottom, for "*ΔΙΟΚΑΠ*," read "*ΔΙΟΚΑΗ*."

— 404 — 14 for *OVA*," read "*ΟΥΑ*."

— 411 — 8 for "Latitude 25° 43'," read "Lat. 25° 47' 26'."

In Table IV. of the Estimate of Life in India, page 284, the first four figures in the second and third column should stand thus :

Age.	Survivors.	Deaths.
20	52221	473
21	51748	489
22	51259	522
23	50737	557

The mistake arose from the calculations having originally been made to commence with the age of nineteen, instead of twenty: and the 5 year averages in Table III. page 283, will all be slightly affected by the same cause. The last figure in the second column, page 284, should be reversed; and in the last column but one, for "2080," read "2008."

- Line 414 line 3 from below, for "*molluscæ*," read "*mollusca*."
- 444 — 36 after "ministry," insert "of a man."
- 445 — 3 from below, for "2125," read "212.5."
- 446 — 7 for "in bullion," read "bullion."
- 447 — 21 for "will be," read "would be."
- — — after "at any," insert "rate."
- 480 — 15-16 for "*Tariqa-i-Chishita*," read "*Tariqa-i-Chishtia*."
- 483 — 36 for "lost about," read "tost about."
- — — 39 for "*Mújtahid-i-mústaquill*," read "*Mújtahid-i-mústaquill*."
- 485 — 20 for "*Taqwiat-ul-Imám*," read "*Taqwiat-ul-Imán*."
- 487 — 15 erase "5" at begiuning of line.
- 488 — 7 for "differences," read "difference."
- 489 — 20 for "*Káfr*," read "*Kufr*."
- 491 — 23-24 for *Ishrák f'il Tasarrafa*," read "*Ishrák f'il Tasarruf*."
- 492 — 10-11 for "the authority or influence of Saints, as respecting intercessors," read "respecting the authority or influence of Saints as intercessors."
- 498 — 23 for "*Khátim*," read "*Khátima*."
- 501 — 12 after "A B C," insert "[fig. 5.]"
- 505 — 20 for "5 53 59," read "5 52 59."
- 506 — 11 "5 53 10," read "5 53 27."





# JOURNAL

OF

## THE ASIATIC SOCIETY.

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No. 12.—*December*, 1832.

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I.—*Analysis of the Purānas.* By H. H. Wilson, Sec. As. Soc.

#### 4. THE VÁYU PURÁNA.

The *Váyu Purána* is so named from having been originally, it is said, communicated by VÁYU, or the deity of the wind, to the assembled sages. It afterwards descended to KRISHNA DWAIPAYANA VYÁSA, by whom it was taught to his disciple LOMAHERSHANA, and at his desire it is repeated by his son UGRASRAVA to the holy ascetics at *Naimisharanya*, agreeably to the form in which these works usually commence.

At starting however, a peculiarity occurs: the right of SU'TA to the possession of the *Vedas* is denied, and he admits that he is entitled to teach only the *Itihásas* and *Purānas*. This distinction is attributed to his equivocal origin which is very obscurely assigned to an error at a sacrifice held by PRITHU, in which the *Ghí* appropriated to VRIHASPATI, the teacher, was confounded with that set apart for INDRA, the disciple, and from the oblation, termed *Sutya*, SU'TA was produced. He consequently held an intermediate station between the *Brahman* and *Kshetriya*, whom these gods, it may be inferred, severally represent; and whilst in one capacity he is a scholar of VYÁSA and a teacher of the secondary scriptures, he is excluded in the other from instructing in the *Vedas*, and restricted to such means of acquiring a livelihood as are compatible with the military profession.

The origin of SU'TA as well as of MAGADHA at the sacrifice of PRITHU, is also related in the *Vishnu Purána*; they are there said to have sprung from the juice of the acid Asclepias, offered on that occasion. The same story opens the *Srishti Khan'da* of the *Padma Purána*, and is there more fully, if not more intelligibly detailed: the account being in fact the same as that of the *Váyu Purána*, and in the very same words, with the addition of some stanzas, and the partial alteration of

others. The legend of the *Vāyu Purāna* is quoted in the commentary of NILAKANTHA on the MAHÁBHÁRAT.

The mixed character of the SU'TA is, however, more rationally explained in the works of LAW. He is the son of a *Kshetriya* father and *Brahmani* mother, and is consequently one of the *Verna Sankara*, or mixed castes. His occupations are properly of a martial character, as driving chariots and tending horses and elephants, but as partaking of the *Brahmanical* order, he is also the encomiast, the herald or bard of chieftains and princes ; such duty being assigned to him and the MAGADHA, by PRITHU, the son of VENA, and it is in this latter capacity that the *Súta* is the appropriate narrator of the *Purānas*.

The origin of the *Súta*, whether legendary or rational, the duties which are assigned to him, and the right conceded to him of teaching the *Purānas*, seem to throw some light on the early history of these works. In all probability, they were at first the traditionary tales of a race of family poets, who corresponded precisely in character with the scalds and bards of the north, and were at once the eulogists of the chief and chroniclers of the family. In this manner some historical traditions were preserved before they were formed into any systematic account, but of course imperfectly and rudely. With the genealogies the poets blended, no doubt, fanciful and mythological fictions, and these were the materials which later writers wove into a connected form, and from which they constructed the primitive *Purānas*. The character of the compilers, that of religious men, gave, however, a new complexion to the competition, and the mythological and marvellous portions came to usurp an undue importance, to the neglect of the historical records. The genealogies were, however, probably preserved with some more care, as they were connected with the worship of certain deities or deified princes, particularly RÁMA and KRISHNA. To the mythology also systems of cosmogony, geography, and astronomy were added, and the five divisions of the *Purānas* were then complete. They were not long however suffered to continue in this condition. Contending sects arose, and each desirous of enlisting the *Purānas* on his side, foisted into them absurd and tasteless fictions, or metaphysical subtleties, calculated to inculcate the worship of some individual manifestation of the Supreme. This began, there is reason to think, about the 7th and 8th centuries with the *Yogis*. The followers of *Saiva* doctrines carried it to a great extent between the 8th and 10th centuries, and in the 11th and 12th, or after the date of RÁMĀNUJA and MADHWÁCHÁRYA the *Vaishnava Purānas* were, there is



little doubt, re-made or re-modelled to a very considerable extent. By all classes, however, the historical traditions of the *SU'TAS*, or bards, were treated with neglect. They disappeared altogether from most of the *Purānas*, and were in all much mutilated and compressed. Such fragments as remain are, however, probably genuine, and when separated from what is marvellous and unnatural, furnish some insight into the actual history of India, in periods remotely past.

To return from this digression, however, to the *Vāyu Purāna*, it may be observed, that as far as can be judged from the portion analysed, it is a work perhaps of the earliest date, amongst the existing *Purānas*, and clearly emanates from the *Yoga* school; it inculcates upon the whole the preferable worship of the forms of *SIVA*, but its sectarial bias is less violently displayed than is usual in these works, the legends are fewer, the cosmological parts are much more detailed, and there is altogether a copiousness and consistency of system which is not common in the *Purānas*. It is impossible in going through this work not to feel an air of originality and antiquity about it, which is not perceptible in any of the others hitherto examined. As far as appears to be the case also, from the translated chapters, there is no allusion to works or systems of an indisputably modern date.

The opening chapters profess to give a summary of the contents of the work, but upon the first glance the detail is far from being applicable to the sections that follow, either in subject or arrangement; on a further examination, however, it appears that the summary is more than once repeated, with different degrees of precision, and without any sufficient mark of distinction between the end of one series and the beginning of another; this want of method is not unfrequent in *Hindu* works, and the first books of the *Mahābhārat* and *Rāmāyana* furnish specimens of the same defective mode of indexing. There appear to be three indexes in the first chapters of the *Vāyu Purāna*, of which the two first are partial and inappropriate; the third is more regular and entire, and corresponds with tolerable accuracy with the contents of the *Purāna*, as far as they extend in our copy, or to the description of the *Manwantaras*. The index then proceeds to the families of the sages and kings, observing apparently very little order in the details, but comprising some curious particulars: as in the *Vishnu Purāna*, the account is carried forward into futurity, and the kings of the present age are noticed. These historical sections are followed by cosmology, terminating with the destruction of the world at the end of a *Kalpa*; the *Purāna* then gives the history of *VYĀSA*, and of the divisions of

the *Vedas*; it comprises the legendary origin of NAIMISHĀRANYA, and the occasion of the assemblage of the RISHIS at that place, and concludes with an account of the incarnations of SIVA, which, if we may judge from the way in which that subject is treated in the *Kurma Purāna*, is the succession of teachers of the *Yoga* doctrines. All these chapters are wanting in the only copy of the *Vāyu Purāna* we have been yet able to meet with. They should form the latter half of the *Purāna*.

In the fourth chapter, the deity who existed before creation, is represented as eternal, without beginning or end, and the origin of all things, comprehending within himself the two substances or attributes by whose joint operation perceptible objects were formed, or *A'tmā*, Spirit, and *Padhāna* or *Prakriti*, Matter: the mode in which elementary or primitive creation was evolved from the action of these two, is then described in technical language, conformable to the *Sāṅkhya* cosmogony. The seven principal elements are the *Mahātatwa*, *Ahankāra*, *A'kās*, *Vāyu*, *Teja*, *Ap*, and *Prithivī*. The first may perhaps be termed the principle of collective animated elementary existence, and the second the principle of individual animated elementary existence, although it must be confessed, that no very distinct and definite idea appears to be any where attached to them; they may be sometimes distinguished as mind, generally and individually, or elementary intellect free from passion or emotion in the first case, and joined with it in the second. The *Mahātatwa* again, might occasionally, be rendered the Divine Spirit connected with substance, but exempt from passion, and which upon addition of the *Gunas* or qualities, becomes *Ahankāra*: the difficulty of explaining these terms satisfactorily is however, inseparable from the visionary character of the existence of the things which they denominate. The other five elements, if not more intelligible, are at least more familiar to us, and though as little susceptible of definition are, with one exception, cognisable by our senses, and therefore suggest positive notions. *A'kas* is ether, a subtile element thinner than air. The other four are air, fire, water, and earth. These partially combined into an egg which lay in water, the water was invested by fire, the fire by air, the air by *A'kas*, the *A'kas* by *Ahankāra*, the *Ahankāra* by the *Mahātatwa*, and the whole by the *Avyakta* or imperceptible, identified with *Prakriti* or Nature; from the egg, *Hiranyagerbha*, the four headed *Brahmā* was produced, the immediate agent of creation, the materials of which, as far as this universe consisting of fourteen *Lokas* or worlds, is concerned, lay concealed within the same recess from which he issued.



BRAHMA' the Creator, is in fact, only an embodied portion of the *Raja Guna*, the quality of passion or desire, by which the world was called into being. RUDRA is the embodied *Tama Guna*, the attribute of darkness or wrath, and the destructive fire by which the universe is annihilated, and VISHNU is the embodied *Satwa Guna*, or property of mercy and goodness, by which the world is preserved ; the three exist in one, and one in three ; as the *Veda* is divided into three and is yet but one, and they are all *A'srita*, or comprehended within that one being who is *Parama* or supreme, *Guhya* or secret, and *Servātmā* the soul of all things.

So far the theology of the *Vāyu Purāna* agrees with the deism of the *Vedānta*, but it presently deviates from this doctrine in the manner common to all the *Purānas*, and to a purport which may be supposed to have mainly influenced the present form of these compositions. Agreeably to the *Vedānta* school, the Supreme Being, though of one nature with his emanations, possesses a sort of separate existence, and is always *Nirguna* or void of attributes. According to the *Paurānic* doctrines however, he is not merely *Nirguna*, but is occasionally *Saguna* or *Sakalyāna guna*, possessed of attributes, or at least of all excellent attributes. In this latter case he becomes perceptible, and appears in the form either of VISHNU or SIVA, according to the sect to which the work that so describes him appertains : his appearances are regarded as his *Līlā* or pastime, and in this sense, the *Vāyu Purāna* observes, the *Paramatma*, or *Yogeswara*, has engaged in various sports and consequently assumed a variety of incarnations, and is known by different names.

The successive stages of the creation of the world, are enumerated as in the *Kūrma Purāna*, and amount to nine. They are somewhat differently named in one or two instances, but the meaning is probably alike. The nine *Sargas* are the *Mahat*, *Bhūta*, *ind Aréyaka*, *Maukhya*, *Tāryaksrotas*, *Urddhasrotas*, *Arvāksrotas*, *Anugraha*, and *Kaumāra*, or matter, the elements, the senses, the earth, animals, gods, men, goblins, and BRAHMA's sons, a list agreeing with that of the *Kūrma Purāna*, except in the third, which is there called the *Tejasarga*, or creation of light or lustre. The two works also agree in calling the three first creations *Prākrita*, or elementary, and the six last *Vaikrita* or secondary, the elements being only made to assume *Vikriti* or change of form.

The subject of creation is continued through the 7th and 8th chapters, and the next sections are occupied with directions to practise abstract devotion, and obtain a knowledge of the Supreme Being, interspersed

ed with an account of the origin and duties of various sages, and the attributes and power of some of the forms of SIVA. In the eighteenth chapter commences an enumeration of the *Kalpas* which is continued through the 19th and 20th. Thirty-three *Kalpas* are mentioned, the last of which is called the *Viswarupa* or *Sweta*, from the prevailing form of SIVA being of a white complexion. From this circumstance it appears to be the same with the *Vāishnava Vārāha kalpa*, in which SIVA is incarnate on the mountain *Ch'hagala* as the *Muni Sweta*; having for his disciples *Swaita Swetasikha*, *Swetāsya* and *Swetalohita*, the same who are mentioned in the *Kurma Purāna*; the list of the *Kalpas* is followed by that of the *Mahāyugas* in the present *Manwantara*, in each *Dwāpara* of which, as well as a *Vedavyāsa*, there is an incarnation of SIVA, who has four sons or disciples, all *Mahāyogis* and portions of the divinity. Those of the present period are *Lakuli*, and his sons *Kusika*, *Gārgya*, *Mitraka*, and *Rushta*; the scene of their *Yoga* is called the *Kāyārohana Kshetra* on mount *Meru*.

The subject of creation is not yet dismissed, and blended with illustrations of SIVA's supremacy continues through several other chapters. In the 23rd chapter, BRAHMA and VISHNU are introduced as propitiating MAHÁDEVA and receiving boons from his favour. To BRAHMA he grants progeny; to VISHNU praise; admitting him to be along with himself the source of all things, though in an inferior degree, thus he says to VISHNU "I am *Agni* or fire, thou art *Soma* the moon; thou art the night, I the day, thou art falsehood, I am truth: thou art sacrifice, I am the fruit of it; thou art knowledge, I am that that is to be known," &c.

The origin of RUDRA from BRAHMÁ by virtue of the boon given to him, and the various appellations assigned by BRAHMÁ to that form of SIVA are next detailed, and this is followed by an account of the families of the seven *Rishis*, BHRIGU, MARICHI, ANGIRAS, KARDAMA or PULAHA, PULASTYA, KRATU, and VASISHTHA. ATRI is not mentioned here, but his wife, ANÁSUYÁ is named as the mother of SRUTI the wife of the son of KARDAMA or PULAHA, named also KARDAMA, from which alliance the patronimic *A'tréya* is applied in the text to the descendants of that sage. The place left by ATRI's exclusion, is occupied by BHRIGU, who it appears, is considered as a form of MAHÁDEVA. The descendants of BHRIGU are called BHÁRGAVAS, and a branch of them sprung from the grandson of BHRIGU named MRIKANDA are termed MARKANDEYAS; the descendants of MARICHI are the KAS'YAPAS from KASYAPA his grand-son, the posterity of ANGIRÁ are the ANGIRASAS; of PULASTYA the PAULASTYAS, of VASISHTHA the VÁSISHTHAS, and of KRATU the pigmy sages called BÁLAKHILYAS. These denominations and genealogical classifications, as well

as several other details to be found in the same chapter, differ materially from the notions more generally received. We are not yet prepared to say how far they are peculiar to this *Purāna*.

Some curious, and as far as yet known, peculiar mythology, follows, describing the different kinds of *Agni* or fire, and particularising the *Pitris*, as the same with the *Ritus* or seasons of the year. A mythological description of the divisions of time then ensues; it is clearly an attempt to allegorise the year, and its divisions, in common with the worship of collective ancestors by fire; hence the year is called *Agni*, the seasons the *Pitris*, and the five portions of animate and inanimate creation of men, birds, beasts, reptiles, and trees, &c. are the five *Ar-tavas*, the sons of the seasons or progeny of time: the allegory however is rather perplexed, and the whole description mystified and obscure. The names given to the months and seasons here are double. One set being the usual terms, and the other being peculiar: the name of the months are the same as those cited by Sir WILLIAM JONES from the *Vedas*, as the names of the solar months (A. R. III. 258.) The seasons as the *Pitris* are called *Kasa*, *Agni*, *Jiva*, *Sudhāvān*, *Manyamān* and *Ghora*.

The *Pitris* are distinguished into two classes, the *Vārhishtas* and *Agniswāttas*; these are said to have had two daughters, *Menā* and *Dhārini*; the former became the wife of *Himāvat*, the latter wedded *Meru*, and from her was descended *Daksha*, the mention of whom gives occasion for the narration of his celebrated sacrifice, and for a number of stanzas in praise of *SIVA*'s supremacy.

The 30th chapter contains a very summary account of some royal dynasties, and then particularises the duration of the four ages as 12,000 years. This calculation implies that the years are years of the gods, such being the period of a *Mahāyuga*, agreeably to *Pauranic* chronology, at the same time the text does not specify what years are intended\*. As analogous to the divisions of time, the *Purāna* itself is here stated to consist of 12,000 stanzas; a number different from that stated in

\* The proportion in which the years are divided are,

Krita .....	4800
Treta .....	3600
Dwapara .....	2400
Kali .....	1200
<hr/>	
	12,000

the same is given in the *Paulisha Siddhanta*, as cited by *Bhattacharya*. (A. R. XII. 249.)



the *Matsya* which assigns twice that amount or 24,000 *Slokas* to the *Vāyu Purāna*.

A number of chapters then follow, appropriated to *Pauranic* geography, the description of mount *Meru* and the residence of the gods, the seven continents and the divisions of the universe above and below the earth; considerable portions of these chapters have been translated by the late Colonel WILFORD. The *Pauranic* system is here very fully, and upon the whole, distinctly detailed. The chief difficulties that occur being perhaps rather the fault of the transcript than of the original work.

The same remark applies to the chapters that follow, in which the astronomy of the *Purānas* is detailed with the same minuteness as the geography: on these two topics, therefore, the *Vāyu Purāna* is a valuable authority.

Some of this astronomy is rather unusual, the relative sizes and situations of the planets, their cars, their steeds, and other appurtenances, and their revolving round *Dhruva* or the pole, to which they are attached by cords of air, as the potter's wheel turns on its pivot, are in all the ordinary strain; but we have a statement regarding the length of a *Yuga*, and the commencement of the solar year, which are not conformable to received notions, or the actual state of things.

It is said, for instance, that a *Yuga* consists of five years; what kind of *Yuga* is intended is not specified. BENTLEY (A. R. VIII. 227), cites the *Graha Manjāri* for a *Mahā Yuga* of five years, and in his last work on the ancient astronomy of the *Hindūs* he refers the construction of a cycle of five years to what he considers, the first period of *Hindu* astronomy, or from B. C. 1181 to 961.

This cycle it is said begins when the sun is in *Sravana*, and it is again stated that *Sravana* is the first of the *Nakshatras*, and *Magha* the first of the months; according to the authority just cited, such could have been the case only between the years 204 B. C. and A. D. 44. when the year began with the month *Magha*. If Mr. BENTLEY is correct, this portion of the *Purāna* at least, is of considerable antiquity whatever may be the date of the rest (Ancient Hindu Astronomy, p. 271.) Mr. BENTLEY also adds that, the mode of computation by which the commencement of the year was made to begin with a different month and asterism, was entirely laid aside by the *Hindū* astronomers subsequent to A. D. 538.

The same chapter contains a description of the *Sisumarā*, which is interpreted by Mr. DAVIS to typify the celestial sphere (A. R. II. 402.) The description is to a similar effect with that which he has translated

from the *Bhāgavat*, but is shorter and less particular. There is also this rather unintelligible addition, that the stars of the sphere never set ; but the passage may signify, that they are not annihilated at the usual periods of destruction. The text is in this place evidently incorrect, and the translation being made from a single copy, it is not safe to venture any emendation.

A legendary account of *Nīlākanthā* or the blue-necked SIVA follows, and the description of the classes of the *Pitris*, and their feeding upon the lunar nectar ensues. The introduction of obsequial ceremonies and the worship of the manes appears to have originated with *PURURAVAS*, a not unlikely circumstance, and one which explains the legend of his being descended both from the sun and moon ; the worship of the manes being connected with the conjunction of these luminaries. The list of *Pitris* differs in some respect from that of *Menu*, and from that given in a manual used by the *Brahmans* of Bengal, in which a verse cited from the *Vāyu Purāna* enumerates the following as the seven classes, *Saumyas*, *Agniswattas*, *Vārhishtadas*, *Havishmantas*, *Ushmapas*, and *Ajyapas*. In the chapter now under consideration there are but four particularised. The *Saumyas* or *Somapas* ; the *Kavyas* or *Ajyapas* ; the *Verhishadas*, and *Agniswattas*. Three others are merely named, the *Ushmapas*, *Devakirttyas*, and apparently the *Lekhas* and *Bahwikasyas* ; but these are unusual and probably inaccurate appellations. The whole of the section is obscure, incorrect, and often unintelligible. The same may be said of the two remaining chapters, which treat of the divisions of time and the influence of the four ages.

Without being in possession of the contents of the remaining portion, at least one-half of the *Vāyu Purāna*, it is impossible to offer any opinion on the date as derivable from internal testimony. As far as the portion analysed extends, it may be considered perhaps, as the oldest of the actually existing *Purānas*, and it has every appearance of being a genuine work, conforming more closely than any yet examined to the definition of a *Purāna*, and admitting few of the unconnected digressions and legendary absurdities by which the course of these compilations is so commonly interrupted, and the established order widely disarranged or wholly obliterated.

The *Vāyu Purāna* is not unfrequently omitted in lists of the eighteen *Purānas*, but in that case it is considered to be the same with the *Saiva Purāna*, which takes its place. As now met with, however, the two works are not identical.

II.—*Extracts from a Journal kept by Mr. J. Emmott, Master Attendant at Mergui, whilst visiting the Sapan Forests.*

[Communicated by G. Swinton, Esq. Chief Secretary to Govt.]

I quitted Mergui on the 22nd August, 1830, and proceeded up the Tenasserim river, with the view to inspect and report upon the forests of Sapan-wood.

After passing the old city of Tenasserim and numerous islands, sand-banks, rocks, and creeks, the names of which I have noted, and many of which are described, I reached the first sapan forest on the 8th September, and continued ascending the river till the 11th, when being taken ill, as also most of the boat's crew, we were obliged to return.

From that date to the 1st October, I returned to Tenasserim, and then re-ascended the river to the place I quitted on the 11th September.

I find, that there are no less than four ranges of the Tenasserim hills, instead of one, as is marked in all the maps of the country which I have seen.

From the 2nd October to the 17th, I was employed in examining the forests.

The forests of Sapan-wood are considerably exhausted; the wood-cutters no longer meet with it on the banks of the Tenasserim river, but are obliged to proceed about one day's march inland, before they can meet with it in any quantity. Many of them cross the boundary, and obtain it from the Siamese territory.

*August 23rd, 1830.*—At one p. m. arrived at the old city of Tenasserim. It is situated on the bank of the river, and was originally surrounded by a brick wall, which is now much dilapidated, and overgrown with jungle. The west side was strengthened by a ditch and breast-works. The town at present consists of two streets, running parallel with each other, east and west. The population amounts to about six hundred souls. A few miles beyond Tenasserim, the banks of the river become steep, with moderate soundings: frequent hills rise on the west, from five hundred to one thousand and three hundred feet high; in the middle of the river are turtle banks; along its side are seen extensive Karian and Durian plantations: the maps of this part of the country shew only one range of hills, but four distinct ranges were observed.

*August 26th, 1830.*—It is generally reported, that the Karian tribes usually reside on the mountains and hills; but what I have seen of these people, I find they invariably occupy table land, or the base of

hills. They always select a rising ground on the brows of hills, to sow their grain—a practice quite contrary to that adopted by their neighbours, the Burmese, who invariably choose a low flat ground for this purpose. Their manners and habits are also different from the Burmese; their houses are generally neat and well built, standing as high as fifteen or eighteen feet from the ground, with a moveable ladder, which is drawn up at nights;—this is done to protect themselves from the nocturnal visits of tigers, elephants, and other wild beasts;—the inside of their houses and their simple rustic furniture are kept extremely clean. Accustomed always to migrative habits, a Karian is naturally indifferent to laying out his plantations with any judgment or taste, and consequently little labour is devoted to the rearing of trees, the fruit of which may be reaped after a lapse of time. The soil preferred by them is of a red kind, found near the base of the hills, and on this they plant vegetables, roots, and yams. Some of the stumps of the jungle trees answer them as supporters to their betel, yam, and other vines. Although in disposition they are far from resembling savages, yet in their way of living they may be identified with them; every animal or reptile, that comes in their way, serves them as an article of food. Met boats with Chinese and Burmese proceeding up the river for sapan-wood:—freshest strong:—shores covered with brush-wood:—passed another range of hills:—commenced tracking:—passed a Siamese fort:—river apparently not navigable in the dry season:—constant rain:—saw tracks of wild elephants and buffaloes:—passed several creeks, islands, and mountains:—nothing of interest occurred until

*September 3rd, 1830, (near Kotoung.)*—At noon we came to a creek called *Phia Hat-thwet*; the Burmese maintain, that their god came out of this creek, and took up his abode for some time in a cave, on a rising ground, a short distance from it. The rock under which the cave is may be about three hundred and eighty feet high. On its south side, it forms three squares;—the entrance is towards the westward. Its north-east angle slopes gradually down to the base of the hill;—the entrance to the cave is on a gradual ascent for about two hundred yards, when you come to an irregular arch, about fourteen feet in diameter. The inside is very spacious, and one is struck with wonder and amazement on beholding such a spacious cave. Its length from the entrance, east and west, is about one hundred and forty-six feet, and from north to south, two hundred and sixty-seven feet. The dome inside at its highest part is one hundred feet from the ground. The rock of the cave is of a porous nature. In former times,



I am told, that the Siamese used to collect from this cave some tons of saltpetre annually. I must say, that the grandeur of this cave surpasses the celebrated one on the Isle of Elephanta, or any thing of the kind I ever saw in my life. Left this cave, and continued our course up the river, steering on a westerly direction. At 4 p. m. passed a high range of hills in a north north-west direction. Beyond this, the river deepens to seven fathoms, with rocky and muddy bed:—passed a creek, said to empty itself into the Tavoy river:—was deterred from investigation by the boatman's assurance, that no native ever frequented it:—a long reef of sunken rocks, with two to four and a half fathoms water:—freshes running *ten* and even *fourteen* miles an hour:—forty men could not track the boat:—banks of the river covered with jungle so thick as to be impenetrable.

*September 11th, 1830.*—Returned to Tenasserim, ill, and again ascended the river, to the same spot, by the 1st October.

*October 2nd, 1830.*—At 10 A. M. arrived at the second range of Sapan forests on the east bank of the river: the hills which surround this forest are about five hundred feet high. Saw a boat with twenty-six men, returning with six rafts of sapan-wood. Here I landed and visited the forest. The trees grow on hills, as well as on plains. The mountain-torrents had made such chasms through the forest to the river, that it was with difficulty I could cross them before I could well get at the place where the natives are employed cutting the wood. I suffered a great deal in this excursion from the bites of leeches and stings of musquitoes, which abound in the forests. The day was wet throughout. The leaves of the sapan tree are small, and resemble much that of the tamarind, of a dark-green. It bears small flowers, of deep orange-colour, which blossom during September and October. The tree is in full growth, and worth cutting when it attains the height of twelve or fourteen feet:—the bark is of a grey color, with notches, from each of which protrudes a sharp thorn, about a quarter of an inch long. These trees do not grow close to one another, and are not found near the banks of the river.

*October 3rd, 1830.*—At 7 A. M. proceeded up the river in a northerly course. Fell in with a boat at 9 A. M. from Mergui, with spirits and other comforts, for the purpose of selling to those employed in cutting sapan-wood. This boat was owned by a Chinaman.

*October 4th, 1830.*—At day light, wind easterly, arrived at Yebew Gheune, formerly an extensive place for sapan-wood, but now almost exhausted. Left a boat here belonging to some Chinese and Burmese proceeding up for sapan-wood. The river here is rocky. All the



natives are now obliged to enter the Siamese ground to cut sapan-wood. The wood of this tree is so very hard, that a labourer thinks he has performed a good day's work if he has hewn three trees from sun rise to sun set ; and as the forests are always damp and swampy, nearly one-third of the people who proceed thither, are obliged after a few days labour, to return to Mergui from suffering under fever, or bowel complaints ; beside the musquitoes and leeches, the wood cutters have to contend with a species of green snake from two to ten feet long, and found among the leaves of the sapan tree. The bite of one of these reptiles is so very poisonous, that the sufferer seldom survives an hour. It preys upon birds, especially the peacock, which it chases from tree to tree with great swiftness and success.

*October 5th to the 9th, 1830.*—Continued our way up to the river.

*October 10th.*—Arrived at a very steep hill, and made an attempt to ascend it, but failed. I examined the sapan forest about it, but found it bare of trees ; crossed the base of this mountain through a deep ravine, and found great difficulty. In some places I was obliged to be lowered down with ratans. We traversed round it, and came to the banks of the river on the north-west side. It was so very steep that we were obliged to make a bambu raft, and proceed on it to our boat. It rained throughout the day.

*October 11th, 1830.*—The head-man of my boat left me with six other Burmese, and proceeded into the sapan forest : towards the evening they returned on a bambu raft ; and brought some branches of the sapan tree, and reported to me that there were plenty of full grown trees where they had been.

*October 12th.*—Arrived at Meen wa Gheune, a famous place for procuring sapan wood. Continued our way in a northerly direction, passing at a distance immense sapan forests ; passed a double range of hills called Ara Moung Tounng. This range lays north-west and south-east ; they are not very high.

*October 13th, 1830.*—Ordered the boat to be got ready, and started at 7-30 A. M. landed on a sandy beach and crossed a narrow neck of land, where we came to a creek of considerable breadth, called by the Burmese *Pah Goon*. It leads to Siam through a range of mountains. I proceeded up this creek for some distance, and found the forest here recently cut.—It is navigable for small boats.

During the night we had much rain, with thunder and lightning.

*October 14th.*—At day light continued our course up the river ; at 9 A. M. arrived near the falls of *Toung dounng ka dain*, but the freshes being strong, we could make no use of our oars, and were obliged

to track the boat along the eastern shore, which occupied more than four hours. At 1-30 P. M. arrived close to the falls; in the centre is a small island, and on each side of it, it is lined with a reef of rocks extending themselves to the main land. The falls are about thirteen feet above the level of the water; on the south side the water rushes with great impetuosity over a bed of sharp pointed rocks with a hollow sound. The depth of water here is about twenty fathoms: saw three or four boats about two hundred yards from the falls, these belong to the sapan wood cutters.

*October 15th, 1830.*—Crossed over to the western shore in a boat, with the whole of the boat's crew. Crossed a mountain, and found the river took a north-west direction and narrowed; from the top of this mountain I saw the whole of the sapan forest as far as my eye could reach; descended the mountain, and walked along the banks of the river until the evening, when I had a raft of bambus constructed, and came down the river and arrived at our boats.

*October 16th.*—After breakfast I ranged along the west banks of the river; I saw some natives cutting sapan wood. Here I saw several straggling sapan trees, each bearing the mark of a knife; and I found on enquiry that they were the property of another gang of wood-cutters. The people whom I met here told me that they intended to go more towards the southward to cut wood, and that the spot where they are now employed, appears to have been occupied by others. These men have, after some labour and time, cut only two rafts. The forests, generally speaking, are not literally covered with sapan trees, but only here and there a tree is to be found, so that the site which the wood-cutter may fix upon for his field, turns out a chance as to its abundance or scarcity. The natives of Mergui, who engage themselves in this enterprize, hold each a share in the produce of their labour.

*October 17th, 1830.*—During the day I employed myself in examining the heights of some of the mountains in the neighbourhood, viz. *Ka moun chat* is about nine hundred feet high: others on the north-west side of the river eight hundred and fifty feet high, and the "Two brothers" (*Area mounng*) mountains are about one hundred and ten feet. Towards the evening, sent my boat to plant two flags on the western shore, as a base line; took the height of *Mecoun dounng tounng*, six hundred feet. This mountain lies to the south-west of *Area moun tounng* hill, and further on, in the same direction, is a round hill about four hundred feet high.

Finding that I could not proceed further up the river, in consequence of the current being so very strong, and some of my boatmen being unwell with fever and bowel complaints, (myself also being troubled with the latter distemper,) and our stock of provisions almost exhausted, I thought it advisable to return to Mergui, which I did on the following morning."

III.—*Some additional Observations on the quantity of earthy matter brought down by the Ganges, its depth and velocity, made during the rainy season of 1832, at Ghazipur. By the Rev. R. Everest.*

The following are the results obtained during the present season in continuation of the experiments described on a former occasion. [Vide page 238.]

Insoluble matter :—		in a wine quart;	in a cubic foot.
July	3rd,.....	1 grain.	30 grs.
—	7th,.....	8 „	240
—	23rd,.....	10 „	300
Aug.	8th,.....	58 „	1740
—	13th,.....	37 „	1110
—	22nd,.....	26 „	780
Sept.	6th,.....	17 „	510
—	24th,.....	8 „	240
Oct.	8th,.....	6 „	180

or 19 grains average for the 4 rainy months, from 15th June to 15th October; add for soluble matter, suppose 2 grains; the whole equal to 21 grains, or about 630 grains per cubic foot.

Velocity of the stream in ft. in an hour.

July	3rd,.....	6,810
—	7th,.....	11,520
—	23rd,.....	21,000
Aug.	8th,.....	42,000
—	22nd,.....	34,560
Sept.	6th,.....	21,600
—	24th,.....	13,320
Oct.	8th,.....	10,800

or 20,200 for the average of the four months, which is equivalent to about four miles per hour.

## Depth of the river.

	ft.	in.
July 22d,.....	19	6
— 30th, .....	22	6
July 7th,.....	25	6
— 14th,.....	28	0
— 23rd,.....	30	0
Aug. 1st,.....	35	6
— 8th,.....	44	0
— 13th,.....	47	6
— 22nd,.....	42	0
— 31st,.....	36	0
Sept. 6th,.....	38	0
— 15th,.....	37	6
— 24th,.....	28	6
Oct. 1st,.....	26	6

or an average of 33 ft. for the four months.

*Note.*—It will be observed, that the averages here given are considerably less than for the last year (1831), as stated in the Journal for June. But on comparing the fall of rain for that, and the present year, as stated in the Meteorological Registers, I am inclined to think that the previous estimate for 1831 is not excessive, but defective. The small branch, or stream, when the river was at the highest, would have a depth of about 12 ft. and a breadth of about 300 ft., an addition so trifling to the main stream, that I have made no allowance for it.

IV.—*Eclipses of Jupiter's Satellites.*

Observed by Mr. Walter Ewer. November, 1832.

Nov. 3. At Chaprah, with 5-feet achromatic, power 150.

	Mean time observed.	Diff. from Naut. Alm.	Diff. from Cal- cutta obs.	
	h. m. s.	h. m. s.	h. m. s.	
Emersion II Sat. ....	7 37 45	5 38 57	0 14 23	W.

Nov. 4. At Digwareh, on road to Hájipúr, 3½-ft. achrom. power 100.

Emersion I Sat..... 6 35 00 5 40 08 0 13 12 W.

Nov. 10. At Hájipúr, (Lat. 25° 41' 11" by sextant,) same telescope.

Emersion III Sat..... 7 41 51 5 41 19 0 12 14 W.

Nov. 11. Do. Emersion I Sat..... 8 31 35 5 40 50 0 12 12 W.

Nov. 27. At Chaprah, 5-ft. achromatic, power 150, "capital observation."

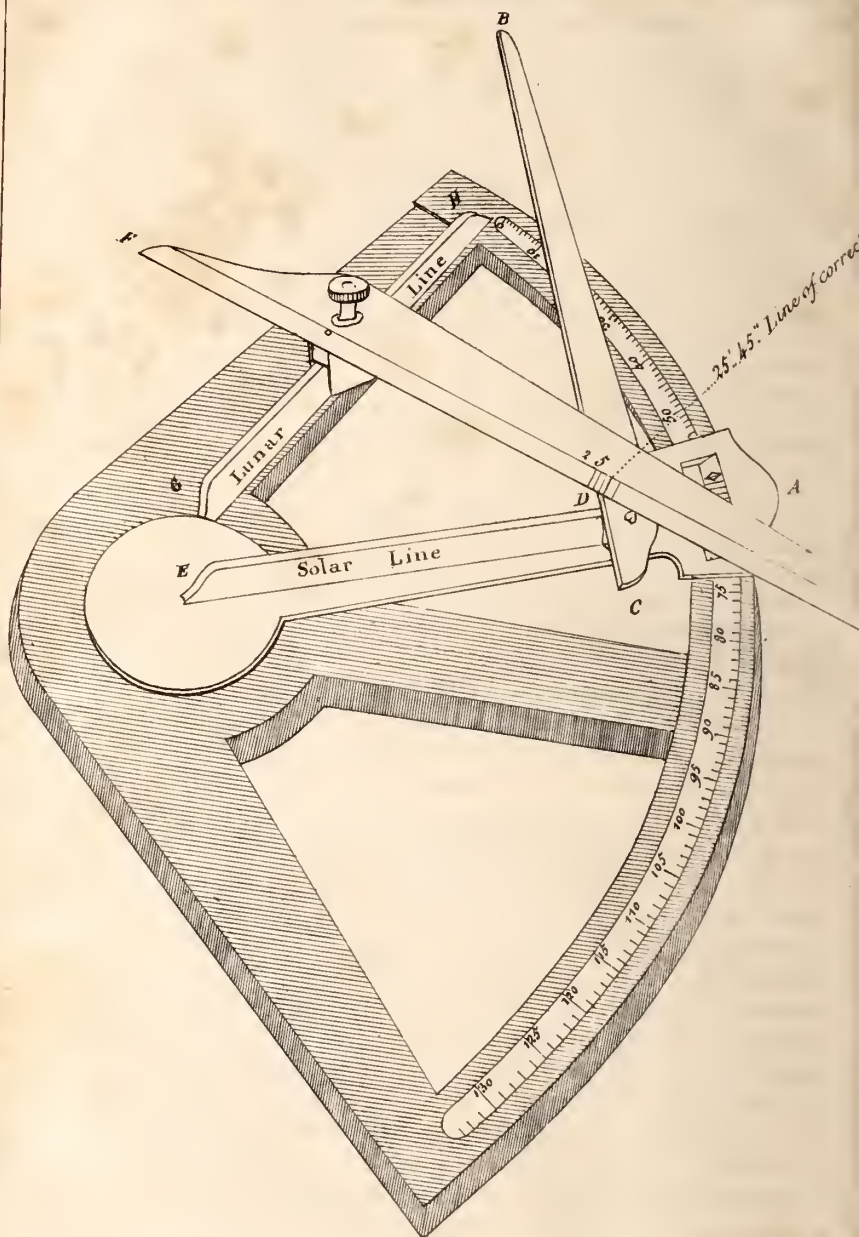
Emersion I Sat..... 6 50 36 5 38 53 0 14 34 W.

The last column shews the difference as deduced from the Calcutta observation, made with a telescope of nearly the same power—(vide page 505-6.)





# COWLES'S ANGLOMETER



V.—*Description of the Anglometer, an instrument for working Lunar Calculations.* By Captain C. Cowles.

The instrument represented in the accompanying drawing (Plate XIV.) was invented by me some years ago, with a view of reducing to easy practice one of the many methods laid down for solving the "Lunar Problem." The method I allude to will be found in Dr. Kelly's "Practical Introduction to Spherics and Nautical Astronomy." In speaking of it, he says in his preface to that work, (page 10.)

"The manner of finding the longitude by the lunar observations is explained at some length in an easy familiar way, and the principles are illustrated by stereographic projections, whence rules are deduced for estimating the correction before hand. As this subject has not been attempted before, it required the more consideration, which has led to the discovery of a method of solving the problem by projection of four right lines from the plane scale; and although this method cannot be insisted on as perfectly correct, yet considering the complicated nature of the problem, and the great simplicity of the projection, the degree of accuracy must be matter of surprize rather than animadversion, as it will be found sufficiently correct for the general purposes of navigation. Where perfect accuracy is required, this method will be useful as a *guide* or check to calculation: and it is hoped, that the extreme facility of the operation may tend to render the practice of taking lunar distances more frequent among the generality of seamen."

Simple as the above method is, there are difficulties, which oppose themselves to its general adoption; for instance, to perform it with any degree of accuracy, it is necessary to have a tolerably smooth surface to work on, good compasses and scale, with a hard well-pointed pencil; on board ship one or other, and sometimes all these requisites are wanting, and when present, it must be recollected, that even amongst intelligent and well educated seamen, there are many who are not *aufait* at the pencil and scale. The object of this instrument is to remedy these inconveniences as far as may be, as it performs the work of paper, compass, scale, and pencil: it has been used by many persons, among whom I may mention Captain Laws, of H. M. S. Satellite, from whose concurrent reports on its merits, as well as from my own experience, I should say, that "its accuracy is matter of surprize;" that under all circumstances, it is a very desirable check on calculation; and, when the "distance" is not great, its accuracy may be depended on without calculation; and lastly, the certainty of being able to determine the longitude, in the course of a few minutes, is a strong inducement to take lunar distances when otherwise they would not be attempted.

Plate XIV. exhibits a perspective view of the instrument as made up by myself with the rude means at my command; the method of using it to clear the lunar distance is as follows:



Place the index A at the apparent distance on the arc of the instrument; then place the plain bar BC on the divided edge BE, or *solar line*, at the sun's altitude; and the chamfered bar DF, on the *lunar line* GH: mark at what division the plain bar intersects it, which note down, and call it the line of correction; and when this falls to the right of the lunar line, it is subtractive; but when to the left, it is additive.

Multiply\* this line of correction by the given horizontal parallax; and divide the product by 62, when the correction is subtractive; but by 53, when additive, to find the "true correction."

To this description I will add a comparative example by the two methods.

*By the usual Formula.*

Given, .....  $\left\{ \begin{array}{l} \text{☉'s Apparent Altitude, } 32^{\circ} 30' 00'' \\ \text{*s Ditto ditto, } 43 43 00 \\ \text{Apparent distance, } 45 19 37 \\ \text{☉'s Horizontal Parallax, } 0 60 09 \end{array} \right\}$  To find the true distance.

☉'s Apparent Altitude,  $32^{\circ} 30'$   
\*s Ditto ditto, 43 43

Sum, .....	76 13 0	Half, .....	38 6	Co. Tang.	10,1056
Difference, .....	11 13 0	Half, .....	5 36	Tangent,	8,9915
Apparent distance,	45 19 37	Half, .....	22 40	Co. Tang.	10,3792
First Correction, ..	$+ 0 6$	Arc, A. ..	16 40	Tangent,	9,4763
	45 19 43	Difference,	6 00	Co. Tang.	10,9784
Second Correction,	$- 25 43$	*s Altitude, 43 43		Co. Tang.	10,0195
	44 54 00	*s Correction, 0 59		P. Log.	2,2626
Third Correction,	$+ 0 15$	First Cor.	0 6	P. Log.	3,2605
True Distance, ..	44 54 15	Sum, .....	39 20	Co. Tang.	10,0865
		☉'s Altitude, 32 30		Co. Tang.	10,1958
		☉'s Cor.....	49 15	P. Log.	0,5629
		2nd Cor.....	25 43	P. Log.	0,8452

*Given as above.*

*By the Anglometer.*

Line of Correction, ....	25' 45''	P. Log.	8445
☉'s Horizontal Parallax, 60	9	P. Log.	4760
			1,3205
		Constant Log.	4629
			8576

Correction, .....	0 24 59
Apparent Distance,	45 19 37
True Distance, ....	44 54 38

\* The use of proportional logarithms will simplify this operation.

## VI.—On the Indications of the Pulse according to the Hindús.

[Translated from the 2nd Section of the *Oushudha-vall*, a Medical Treatise in the *Bhaka* language ; by Rájá Kálíkishen Behádur.]

The treatise, from which the following extract is made as a specimen of oriental notions on medical subjects, professes to be a compilation from the *A'yur Veda*, *Abadhouta*, *Párvatí*, *Sakuní*, *Deváguya*, *Bhoja-Shastra*, *Tantra Purána*, and other works, arranged in the *Bhaka* tongue for the use of practitioners. It was printed in Calcutta in 1826, and its doctrines are of course prevalent at the present day among all those who have not had the advantage of a medical education after the European system. I have thought its publication might be interesting as a matter of curiosity.

Much consideration is required to judge of a man's constitution, by the pulse ; and in some cases it is requisite to feel the pulse of both his arms ; for when the pulsation is found to be the same in either arm, the inference is the existence of bodily equanimity : that part of the arm which is just above the joint of the hand is the place where the pulse is to be felt by the application of four fingers.

The following are the names by which the four navel strings are distinguished ; namely, phlegmatic, bilious, flatulent, and sanguineous. The fingers to be applied are the fore fingers, and the others arranged in due order. If the motion of the pulse felt by the fore fingers be serpentine, and directed upwards, it must be inferred, that the patient's bile, blood, and interior are in a good state. If the pulse rise in a horny form, above the semi-knuckle, it will then be a sure sign of flatulency in the stomach, occasioning pain and giddiness of the head ; but if it throb in the manner a wood-pecker picks grains, the indication will be a bilious disease.

If it be swelled, and rise up, phlegm and bile are to be understood as predominant, and should its motion in this condition be very quick, it will be a sign of fever ; but if, in a swelled state, the pulsation should descend towards the other semi-knuckle, phlegmatic fever will appear to have ensued. If the pulse be faint, a superabundance of heat in the bowels will be indicated ; if it be nearly impalpable, or if it should vibrate at one time upwards, and down at another, this will signify costiveness ; when it becomes cold and weak, phlegm will prevail ; if it run up and down frequently, flatulence and obstructed excretion ; if the motion be like that of a lapwing, it will show the rise of a morbid state of the humours ; and if the pulse become thick from being very hurried, it will quickly languish, and cause death.

When the pulse felt by the middle finger ascends in a thin faint form, or beats the upper semi-knuckle, like a wood-pecker, a bilious

disorder will have taken place, which will also be indicated by the pulse running violently upwards, from the tip of the finger, and in this last case, it is probable, that vomiting and evacuation will ensue, if not already prevalent; phlegm is known when the pulse rises upwards frequently, and fever when strongly; when the pulse spreads, or becomes broad on one side, from the tip of the finger, at the time of rising, this will evince flatulence. If it get up, becoming thick in the lower semi-knuckle, and thin in the upper, the symptoms of virility will be understood to be deficient. Descending down the lower semi-knuckle, it will shew a latent and morbid state of the humours, and the approach of fever; and even in a feverish state, the pulsation will be the same.

If the pulse move upwards weakly or strongly, this will indicate fever; if such movement be not continual, it will imply a want of digestion. If the motion, resembling that of a lapwing, and attended by an almost imperceptible morbid state, becomes thick at once, the pulse will languish instantly, and be a forerunner of death. If the pulsation be at intervals, and confused, death is likely to happen, either after a lapse of four or five days, or within a day or two. When the pulsation is felt by the ring-finger, as drawing straight upwards, bodily, air will appear to be prevalent; but when, being weak, it runs in the same direction, and turns suddenly downward, flatulence will be apparent; besides, when the motion is slow or violent, and something like a knot is felt, it may be taken as the sign of pain in the stomach.

Should the pulse come down the semi-knuckle, phlegmatic fever will become manifest; and should this occur during a fever, attended with violent motion, and descending directly, rheumatism will prevail. If it move up in a triangular form, being broad in the lower and thin in the upper semi-knuckle, phlegm will be discerned. If the pulse, felt by the little finger, is straightly drawn up, the blood will be found in a clarified state; but a knot being perceived in the middle, it will indicate cold.

When the pulse comes down, it will appear that the blood has undergone some deterioration, and if not so already, that it will soon be discharged naturally, or even flow through the ears or eyes.

VII.—*Notes in Natural History.* By Lieut. T. Hutton, 37th N. I.

I have now the pleasure to furnish an additional instance, in which I have observed the surprising increase of some species of insects during the rainy season.

About the 20th August, I accompanied some friends on an excursion to the falls of Tarah, which are situated in the hills about 9 or 10 miles from Mirzapur;

owing, however, to the bad state of the weather, I made very few additions to my collection of insects, and being unable from the continued rain to venture far from the tents, I was amusing myself with watching the camels feeding among the trees under which we had encamped, when I espied a large tick slowly crawling on the ground; it was much swollen, and had probably recently fallen from one of the camels. I secured it in a small box which I carried with me for such purposes, and afterwards in the hurry of returning to cantonments, forgot all about it, by which means it was left imprisoned until the 17th of September, nearly a month afterwards, when on opening the box, I found the insect not only alive, but literally buried in a mass of minute ova, of a brown colour.

I proceeded forthwith to ascertain the number of eggs, which it had deposited during its long and solitary confinement, but owing to their minuteness and my wish to be accurate in counting them, I found I had assigned myself no easy task:—

Remembering, however, the old saying of “faint heart never won, &c.” I persevered, and at the end of more than *four* hours, by which time I was completely tired, I found that I had waded through the almost incredible number of 5,283 ova.

These I kept for six days longer in a small glass phial, at which time the parent died, and the young were hatched, when I destroyed the whole family for fear of their infesting the house.

In a former note, I mentioned the great number of young produced by spiders, and having since discovered one of the means by which they are kept within due limits, I shall proceed to give a slight sketch of their enemy and the purpose to which it applies them.

During the rainy season, but more especially at its close, a beautiful species of Sphecx, may be observed continually entering the room and searching for a convenient spot whereon to build its cell, sometimes selecting the leg of a table or chair, but more generally the wall or door-posts.

This done, it next brings in its mouth small portions of wet clay, with which it plasters the spot and forms a foundation upon which it builds its cell, rounding it into a cylindric form\*, and always commencing at the bottom and working upwards to the mouth of it.

Having thus prepared the cell for the reception of its offspring, the sphex flies off in search of a spider, which it deposits at the bottom of the cell and upon which it fastens its egg.

It then again proceeds in search of more spiders, which are all placed in the cell for the purpose of nourishing the young grub when hatched from the egg.

The cell is then carefully closed with wet clay, and the sphex leaves it.

The grub when hatched, lives upon the store of food previously provided for it, and when it has consumed this, becomes a pupa, in which state it remains for some little time, and when ready to assume its imago or perfect form, it bores a hole through its prison walls and makes its escape.

Several of these cells were formed in different parts of my Bungalow, sometimes singly, sometimes in pairs closely joined side by side; when in pairs they are generally plastered over with a coat of clay which conceals their real form.

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\* These cells when fixed to a wall or other flat surface, have the one side flat, and the other rounded or cylindricform.



The following list will serve to shew clearly why, in spite of the vast increase of the spiders, they do not cause that annoyance which the number would at first lead one to expect.

A single cell contained, ..... 4 spiders.

A nest of two cells contained,  $\left\{ \begin{array}{l} \text{1st cell, ..... 21} \\ \text{2nd cell, ..... 32} \end{array} \right\} = 53 \text{ spiders.}$

A do. do. do.  $\left\{ \begin{array}{l} \text{1st cell, ..... 23} \\ \text{2nd cell, ..... 30} \end{array} \right\} = 53 \text{ spiders.}$

A do. do. do.  $\left\{ \begin{array}{l} \text{1st cell, ..... 13} \\ \text{2nd cell, ..... 17} \end{array} \right\} = 30 \text{ spiders.}$

Total, 140

Again, another insect of a fine blue colour builds a nest of 4 or more cells, one of which I also give as an example, viz.

A nest of 4 cells contained,  $\left\{ \begin{array}{l} \text{1st cell, ..... 23} \\ \text{2nd cell, ..... 15} \\ \text{3rd cell, ..... Pupa} \\ \text{4th cell, ..... Pupa} \end{array} \right\} = 38 \text{ spiders.}$

The form of this last nest is the same as the foregoing, but I do not think the insect is of the same genus†.

Thus, however, we have more than 178 spiders killed by 5 insects alone; consequently, the increase of the species will be little more than equal to the consumption.

Of the insect itself I shall give you a description in some future paper, together with that of several others which I have collected.

I may add, however, that the cell is often built and stored with spiders in less than an hour.

I shall now proceed to make a few observations on the difference in several scorpions which I have examined.

In all the authors that I have hitherto had an opportunity of consulting, I find the number of teeth, in the pectinated plates on the abdomen of these animals, taken as one of the distinguishing marks of species.

This has confused me not a little, as I have lately examined upwards of 30 scorpions of different sizes, scarcely one of which agreed in the number of these teeth, and yet, setting this aside, they are the same in colour, in the number of eyes, and are often found together in the same holes.

In many instances I found *one tooth less* on one side of the pecten, than on the other side, but this deficiency was generally (though not always) supplied by a knob or rudiment of a tooth, which if counted as such made the plates correspond.

The deficiency was almost always at the *inner* end of the plate.

The following catalogue will perhaps shew the differences, better than I can describe them.

- No. 1. A scorpion with 15 teeth in the right pecten, 14 in the left pecten, and a rudiment of a tooth on the left plate. Eyes 8 in number. Colour dark livid-green; tail and forceps brownish; legs and poison-sack brownish straw-colour. Length  $3\frac{1}{4}$  inches. *Scorpio afer*?

† Probably a species of *pompilus*, or some other genus of *pompilidae*. I. T. P.

No. 2. A scorpion with 14 right, 15 left teeth in the pecten; eyes 8; colour of the preceding; length  $3\frac{1}{2}$  ins. No rudiment of a tooth on the right plate. *S. afer?*

No. 3. Pecten with 15 *r.*, 15 *l.* teeth; eyes 8; colour of last; length  $3\frac{1}{2}$  ins. *S. afer?*

No. 4. Pecten with 15 *r.*, 15 *l.* teeth; eyes 8; colour of last; length  $3\frac{1}{2}$  ins. *S. afer?*

These 4 appear to be the same, differing only in size, as the tooth, which in No. 1 is supplied by a knob, and in No. 2 is wanting, may have been broken off.

No. 5. Pecten with 16 *r.*, 15 *l.* teeth; eyes 8; colour the same as above; a knob on the left plate; length nearly  $1\frac{1}{2}$  ins. *!*

No. 5, which is not so much as half the size of Nos. 1, 2, 3 and 4, has nevertheless more teeth on the pectinated plates. Would not this argue, that the number of teeth does not increase with the age of the animal, since the least in size has often most teeth on the pecten?

No. 6. Pecten with 14 *r.*, 14 *l.* teeth; eyes 8; length  $3\frac{1}{2}$  ins.

Pecten with 14 *r.*, 14 *l.* teeth; eyes 8; length 2 ins.

Pecten with 14 *r.*, 14 *l.* teeth; eyes 8; length 3 ins.

Pecten with 13 *r.*, 14 *l.* teeth; eyes 8; length  $3\frac{1}{4}$  ins. A knob on the right plate.

No. 7. Pecten with 13 *r.*, 13 *l.* teeth; eyes 8; length  $1\frac{1}{2}$  ins.

Pecten with 13 *r.*, 13 *l.* teeth; eyes 8; length  $3\frac{1}{2}$  ins.

Pecten with 13 *r.*, 12 *l.* teeth; eyes 8; length  $1\frac{3}{4}$  ins.

No. 8. Pecten with 12 *r.*, 12 *l.* teeth; eyes 8; length  $2\frac{1}{2}$  ins.

The natives say these scorpions inflict very painful wounds, attended sometimes with danger. They are found in holes in the ground.

The next species is much smaller and of a rusty brown colour, differing altogether in the shape of its forceps, which are more lengthened, and slender than in the former species; its general appearance also is much less forbidding. Its sting is not dangerous, but attended with pain, and inflammation of the wounded part; a servant however of mine, who was stung in the foot by one of this last species, was laid up for nearly two months in consequence.

No. 1. Pecten with 28 *r.*, 28 *l.* teeth; eyes 8; colour reddish or rusty brown; forceps long and slender, and very little bulging; length  $2\frac{1}{2}$  ins. of which the tail is  $1\frac{1}{2}$  ins. *Scorpio Americanus?*

These are found on trees, underwood, &c.

No. 2. Pecten with 29 *r.*, 29 *l.* teeth; eyes 8; length  $2\frac{1}{2}$  ins.

No. 3. Pecten with 30 *r.*, 30 *l.* teeth; eyes 8; length  $2\frac{1}{2}$  ins.

No. 4. Pecten with 32 *r.*, 32 *l.* teeth; eyes 8; length 2 ins.

No. 5. Pecten with 33 *r.*, 33 *l.* teeth; eyes 8; length 2 ins.

At first I was much inclined to think, that these scorpions constituted only 2 species, the first of which, the dark livid-green species, I looked upon as the "*Scorpio afer*" in different stages of growth, and the second, or rusty brown species, as the "*Scorpio Americanus*." But on examining more closely I found that the smaller ones had often more teeth than the large ones; as for instance, No. 5, which has 16 *r.*, 15 *l.* teeth, is only  $1\frac{1}{2}$  ins. in length; while No. 8, which is one inch longer, has only 12 *r.*, 12 *l.* teeth. And again in the second species, Nos. 4 and 5, which are only 2 ins. in length, have more teeth than Nos. 1, 2 and 3, which are  $\frac{1}{2}$  an inch longer.



I therefore came to the conclusion, that, as the *larger* animals, which might reasonably be supposed to be the *oldest*, had fewer teeth on the pecten than the smaller ones, these teeth do not increase in number as the animal advances in age from infancy to maturity, and consequently that the difference in the number, must either indicate distinct species, or that the pecten cannot be regarded as affording any distinguishing mark of species.

But there again a question occurs, which I confess myself unable to answer, viz. how, if only one species, to account for the difference in the number of teeth?

Moreover, having procured a scorpion with several young ones clinging about it, I found that the number of teeth in both parent and offspring were exactly the same, the first having 15-15 teeth and being  $3\frac{3}{4}$  ins. in length, and the last having 15-15 teeth, and being only  $\frac{1}{4}$  ins. in length.

This, I think, goes far to prove those above described to be of distinct species.

The stories of these animals committing suicide, when surrounded by fire, are I believe now looked upon by naturalists as mere idle tales, unworthy of credit. Arguing one day upon this subject and not being able to convince my adversary, I procured two scorpions, one of each of the species mentioned above, for the purpose of testing the truth of his statement, and found the result to be as I had anticipated.

The poor animals after twice or thrice running over the glowing charcoal with which they were encompassed, and being as often put back again, were in a minute or two completely roasted by the heat, and expired without making the least attempt to sting themselves.

The animal, when in pain, lashes its tail about very quickly, which might possibly have given rise to the opinion, that it was stinging itself.

I consider it as next to impossible for them to commit suicide, as independent of the hardness of their covering, it is a known fact, that the scorpion when endeavouring to sting *strikes backwards* with much force, whereas in stinging itself it must *push forwards*, which I think it unable to do: but even if it could, I should question its ability to pierce the armour with which nature has clothed it.

It has been said that scorpions are so *fierce* and voracious, that when confined together they invariably fight until but one remains, which devours the carcasses of his fallen enemies. This I can affirm is not always the case, as 8 or 10 of both kinds, which I confined in a large glass-jar, lived very peaceably for 4 or 5 days, although deprived of food; on putting in some beetles however they were speedily devoured. They appear to be very tenacious of life, as three, which I put into a jar of water, lived for four days.

If kept together for any length of time without food, it is more than probable that they would devour each other; but it is scarcely fair to stamp the poor scorpion as a fierce assassin, merely because it does that which, in like cases, every animal, from the Lord of the creation downwards, would be tempted to do, rather than perish of hunger.

I had intended noticing two species of land shells, which I found at Mirzapur; but having much extended the present communication, I shall make them the subject of my next.

Mirzapur, Oct. 26, 1832.

VIII.—*Proceedings of the Asiatic Society.**Wednesday, 12th December, 1832.*

The Honorable SIR EDWARD RYAN, President, in the Chair.

Read the Proceedings of the last Meeting.

The Right Reverend the Lord Bishop of Calcutta, Colonel Thomas C. Watson, and Charles Ray Martin, Esq. proposed at the last Meeting, balloted for, and unanimously elected.

A letter was read, addressed by Babú Rāmkomal Sèn, to the Committee of Papers, stating the circumstances of his connection with the Society since the year 1803-4; he then acted as Registrar and Accountant under Dr. Gilchrist, Mr. Home, Drs. Hunter and Leyden, on a salary of 30 rupees: in 1820, this was increased by Lord Hastings, then President, to 50 rupees, and the duties of Collector were added, with an allowance of 20 Rupees for establishment. In 1829, the Babú was elected a Member, but continued his services as before, giving the emoluments to his son. Seeing the present state of the Society's funds, and the necessity of retrenchment in its expences, he now begged to relinquish his salary, and proposed a new scale of establishment, with a reduced total from Rs. 222 to Rs. 150 a month, making a saving of 72 Rupees.

Resolved, upon the recommendation of the Committee, that the thanks of the Society be presented to Babú Ramkomal Sèn, for his long and valuable services, and his disinterested offer of continuing their gratuitous performance, and that in testimony of its satisfaction, he be elected Native Secretary to the Asiatic Society.

Resolved, that Babú Ramkomal Sen be authorised to retain such establishment as is necessary for the collection of the subscriptions, in communication with the General Secretary.

The Secretary reported the completion of the 17th volume of the Asiatic Researches, and that application had been made to Government for freight for 100 copies for Europe.

*Museum.*

Ornaments worn by Ooriah women. Presented by Babú Ramkomal Sen, with a note.

*Library.*

The following Books were presented by Mr. H. H. Wilson :

Assemani Catalogo de Codici Manoscritti Naniāna, 1 vol.

Belt's Historia Antipodum, 1 vol.

Biot's Traité de Physique Experimentale et Mathématique, 4 vols. in 2.

Georgii Agricolæ de Re Metallicā, 1 vol.

Histoire General des Voyages, 25 vols.

Picart's Ceremonies and Religious Customs, 6 vols.

Vaillant's Numismata Imperatorum, 1 vol.

Vocabulario de la Linga Tagala, 1 vol.

Inscriptiones Antiquæ à Comite Carolo Vidua, 1 vol.

Stewart's Principles of Money, 1 vol.

D'Olivet's *Langue Hebraïque Restituée*, 1 vol.

Tochon d'Ancey, *Recherches sur les Medailles*, 1 vol.

Astley's *Voyages*, 4 vols.

Dictionary, Sanscrit and English, MSS. 4 vols.

The following Books presented by Messrs. Dondey, Dupré and Sons, of Paris.

Chezy, *Reconnaissance de Sacountala, Drame de Calidasa*, 1 vol.

Roger, *Recherches Philosophiques sur la langue Onolofe*, 1 vol.

Carolo Vidua, *Inscriptiones Antiquæ in Turcico Itinere collectæ*, 1 vol.

Klaproth, *Table Alphabetique du Journal Asiatique*, 1 vol.

Klaproth, *Memoires relatives à l'Asie*, 3 vols. in 1.

Refaha, *la Lyre brisée*, 1 vol.

Letronne, *Analyse Critique du Recueil D' Inscriptions de M. Le Comte De Vidua*,

*De Fonscolme, Memoire sur le preambule d'un edit de Diocletien*, 1 vol.

Greppo, *Essai sur le systeme Heroglyphique de Champollion le jeune*, 1 vol.

Blin *Dictionnaire Francaise, Tamul, et vice versa*, 1 vol.

Heber, *Voyage de Calcutta à Bombay, &c.* 2 vols.

Remusat, *Nouveaux Melanges Asiatiques*, 2 vols.

Trebutien, *Contes Inedits des Mille et une Nuits*, 3 vols.

Pongerville, *les Amours Mythologiques*, 1 vol.

Ditto, *Lucrece de la Nature des Choses*, 2 vols.

Marcel, *les Dix Soirées Malheureuses*, 3 vols.

The following Works from various Societies, &c.

The 1st and 2nd parts for 1831, of the *Transactions of the Royal Society*,

*List of the Portraits in possession of the Royal Society*, and

*Ditto of Instruments and Apparatus belonging to the Royal Society.* Presented by the Royal Society of London.

Nos. 50 and 51 of the *Journal Asiatique.* Presented by the Asiatic Society of Paris.

A Selection of Anecdotes, moral and entertaining, by Mahá Raja Kalkishen.

The Memoirs of Ameer Khan, translated by H. T. Prinsep, Esq.—from the author.

Resolved, that the thanks of the Society be presented to the Donors of the above.

The following Books received from the Booksellers.

Lardner's *Cabinet Cyclopaedia*, Spain and Portugal, 3 vols ; Switzerland, 1 vol.

Hardwicke's *Illustrations of Indian Zoology*, parts 10th and 11th.

Tod's *Rajasthan*, 2nd vol.

The Secretary submitted to the Meeting, the Journals and Papers of the late Mr. Moorcroft, placed by Government with the Society.

Resolved, that they be referred to the Committee of Papers, to determine in what manner they may most advantageously be made public.

#### PHYSICAL BRANCH.

##### *Correspondence.*

1. A letter was read from the Right Honorable Sir R. W. Horton, Governor of Ceylon, acknowledging, on the part of the Ceylon Improvement Society, the receipt of the first eight numbers of the *Journal of the Asiatic Society*, and communicating a resolution passed unanimously at their Meet-

ing of the 24th October, "to enter into correspondence with the Asiatic Society."

2. A letter from the Baron de Ferussac, dated Paris, the 10th April, acknowledged the receipt of a copy of *GLEANINGS IN SCIENCE*, and expressed a desire on the part of the "Société du Bulletin Universel" to enter into relations with the Asiatic Society, and to introduce to its Members M. Richy, Juge de la Kacherié à Chandernagore (now a Member of our Society.)

The Baron de Ferussac brings to the notice of Naturalists in India, his work on the Mollusca, now in the course of publication, [of which a prospectus was printed on the cover of our last number.]

3. A letter from Mr H. Piddington was read, presenting in the name of Dr. Harlan, of Philadelphia, the following works :

1. Audubon's Ornithological Biography.
2. Nos. 2, 3, and 5 of Featherstonhaugh's Monthly American Journal of Geology and Natural Science.
3. Description of a fossil Fucus and fossil bones, by R. Harlan, M. D.
4. Description of the Arvicola Nuttali, by ditto.

#### *Museum.*

A letter was read from Dr. Spry, announcing, that he has transmitted to the Society a magnificent specimen of a silicified palmyra tree from Sâgar : also four specimens of the strata observed in digging a well in the jail at that station.

"Sâgar is nearly surrounded by a chain of basalt hills; not in one continuous range, but with here and there a break. About a mile and half N. E. of Sâgar on the Jabalpûr road, a bed of limestone partly in mass and partly crystallized, juts out at the foot of a range of these hills, and in the bed of a little stream, which is dry, except in the rains, and which runs over this limestone bed, these fossil trees are found. Captain Sleeman was the first to observe them. Three or four specimens as large as the one now sent have been removed. They are seen protruding through the soil, which on being removed, exposes the entire root. Masses of the trunk are observed lying about, but an entire trunk has not yet been discovered.

Specimens of rocks and minerals from Mr. W. Cracroft, to complete his series of the geology of Chîra Punjî.

Among these are several specimens of sandstone, with vegetable impressions of twigs and wood; some of the Chîra and Pandua limestones, with their distinct shells: finely crystalline fibrous actinolite; some very pure white porcelain clay, and some gold dust, with magnetic iron sand, as washed from the sand of the Brahmaputra river. Also, through Mr. G. Swinton, some of the auriferous pyrites from Dr. Lamb.

The Secretary presented specimens of zeolites, received from Mr. B. Noton of Bombay; among them a fine transparent greenish prismatic apophyllite.

Dr. Strong communicated a report on the progress of the boring in Fort William.

A third shaft has been opened to the depth of 82 feet, with a very large auger, and appearances are hitherto promising. No well was sunk above the shaft.



Dr. S. presented a list of works on the subject of artesian springs, which was referred to the Committee of Papers.

A letter was read from Captain P. Gerard, dated Simla, 21st October, forwarding the first part of his brother, Dr. J. G. Gerard's, paper on the valley, and section of the Spítí, in illustration of the fossils discovered by him in his visit to that elevated part of the Himalaya mountains.

This paper formed the subject of the evening's lecture.

*Proceedings of a Special Meeting of the Asiatic Society,*

*Convened on Wednesday morning, the 19th December, 1832.*

The Honorable Sir E. RYAN, President in the chair.

The President opened the business of the Meeting, by adverting to the circumstance of their being assembled to consider on the most appropriate mode of expressing their sentiments upon the approaching departure of their Secretary, Mr. H. H. Wilson. After expatiating upon the severe loss which the Society would sustain in this distinguished Orientalist, and the great debt of gratitude it owed to him as a Member and as Secretary—as indeed the chief support of the Institution for so many years—he proposed, that a Deputation should wait upon Mr. Wilson, at his Residence, on the 31st instant, at 10 A. M. with an Address expressive of their feelings on the occasion. He proposed that this Address should be prepared rather by a Committee of competent Oriental Scholars than by himself, as he could not pretend to do justice to the great merits of Mr. Wilson in a field of Literature entirely foreign to his own studies—he wished therefore to unite with himself Dr. Mill and Mr. J. Tytler, as Members of the Committee.

He proposed also, that it should form a part of this Address, that Mr. Wilson should be requested to allow the Society to have his Bust taken by Chantrey, or by one of the most distinguished Sculptors in England—"that it may be placed in this room as a durable monument of his name, and a testimony of the esteem and respect with which his memory will ever be cherished by the Members of the Asiatic Society."

Mr. J. Thomason seconded this proposition, which was unanimously adopted.

Dr. Tytler expressed his ready concurrence in the measure proposed, and begged to add Captain Troyer's name to the Committee, which was agreed to.

Mr. J. Prinsep informed the Meeting, that the expence of a Marble Bust, executed by a superior Artist, was estimated at £200, including the conveyance from England.

Mr. C. R. Prinsep hoped that all Members of the Society "would be invited to accompany the Deputation on the presentation of their Address:" upon which the Secretary of the Physical Class was directed to circulate a copy of the Proceedings to all Members of the Society, and to announce the day and hour of attendance to such as are resident in Calcutta.

In pursuance of the resolution passed on the 19th, the Deputation of the Society, accompanied by most of the members, proceeded in a body to the residence of Mr. Wilson on the 31st, where after the usual ceremonies of courtesy, the Honorable President Sir Edward Ryan read the following Address, which had been prepared by the Committee nominated at the special meeting.



## ADDRESS.

THE ASIATIC SOCIETY TO H. H. WILSON, ESQ. THEIR SECRETARY.

“When other Societies in this Presidency, which, either in science or the lighter walks of literature, have shared the benefit of your counsel and assistance, are now anxious to associate their expressions of gratitude and regret with your approaching departure from India, it would ill become that one with which your connection is the oldest and most important of all, to suffer the most distinguished of its members to leave these shores, without giving some public utterance to the sentiments which must on such an occasion animate every individual member.

From the time, now nearly 50 years since, when the ASIATIC SOCIETY was instituted, “for inquiring into the History and Antiquities; the Arts, Sciences and Literature of Asia”—none, Sir, has with greater assiduity, or more splendid success, contributed to the advancement of that object, than yourself. In more than one department of their varied inquiries, your services are eminently conspicuous: but in that one, which must on every account claim precedence among the subjects of this Society’s research, they are pre-eminent and unrivalled.

The ancient learning of India, which from the days of Pythagoras downward, had been the object of distant admiration, but never of clear definite knowledge, to the whole of civilized Europe, had indeed, at the period of your first arrival here, begun to emerge from the obscurity which had for ages encompassed it. The labours, as we are proud to declare, of some of the earliest members of this Society, had led the way in unlocking the sacred treasures of Brahmanical literature: through the ardent inquiring mind of our illustrious Founder and President, partly preceded, partly accompanied and followed, by the profound erudition of Colebrooke, the philological diligence of Wilkins, and some others; specimens of Indian genius and science had been given to the world in an English dress; and the matchless language in which all these treasures were contained, unknown before and unstudied by Europeans, except a few who keeping it from all others would have made it an instrument of their own interested views, was now partially exhibited to the more inquiring of the students of the West. But fully to throw open this remote and difficult walk of learned research, to make what was hitherto necessarily confined to a few amongst ourselves intimately conversant with the Pandits of India, accessible in some degree to others destitute of this advantage—to render the study of Sanscrit, as that of Arabic and Persian had long been, possible, if not easy to persons confined to the libraries of Europe—and thus create that general diffusion of the study which, already reaching beyond our countrymen, is stimulating to exertion the laborious students of France and Germany, this, Sir, is a merit, which belongs, above every other individual, to you.

For the grounds of this judgment, we need point only to your Sanscrit and English Dictionary: a work, which, while facilitating and accelerating the progress of all subsequent students, can hardly be appreciated justly by any who has not some experience of this gigantic species of labour: a labour so immense, that, even when applied to the long-studied classical idioms of Greece and Rome, it has been characterized by one of the most eminent restorers of learning as comprising within itself alone every variety of literary toil. In the *present* instance, when we consider the multifarious sources from which the compilation was to be made (none of which, with one brilliant exception, had been before subjected to the severe accuracy of European criticism),—the

boundless extent of the language itself—the quantity of research often necessary for ascertaining the precise import of even inconsiderable vocables among the thousands here enumerated and explained;—this work, so lucid in its arrangement, its interpretations and etymologies, must ever be regarded as a magnificent monument of philological skill and industry. The edition of 1819, setting aside the consideration of those additions just now published, with which your subsequent labors have enriched and nearly doubled its value—that first edition alone would amply deserve this character. Under any circumstances, it would be an excellent and valuable Sanscrit lexicon. Considered as the *first* in any European language, it is admirable, and beyond all ordinary praise.

But we feel, Sir, that it would be unjust to your high merits in this department of learning, were we to dwell too much on this one production, great as it is, indeed pre-eminently valuable in its kind, and sufficient of itself to establish the reputation of any oriental scholar. The several translations of classical Indian compositions, which, before and after the publication of your great work, you have given to the world, have shewn how well you could yourself tread those remote and arduous paths of literature which your labours had made free to the approach of others: they have added to the character of deep recondite erudition—the more desirable, if less distinguished, praise of a highly cultivated mind, and poetic taste and feeling. These qualities, not common in their separate excellence, but in their union truly extraordinary, are visible in your first published work, the version of the Cloud-Messenger of Cālidāsa, as well as in what is among the latest, your selections of the Dramatic Literature of the Hindūs: and while the Sanscrit scholar wonders at the graceful ease and delicacy with which the peculiar character of Indian composition is most faithfully represented to English readers, the English general reader—he at least who has taste to discern the forms of beauty in the most unwonted combinations, and the philosophy to sympathize with man, however diversified by climate and institutions—cannot fail to be both delighted and instructed with the perusal.

It were really impossible to particularize in this address, the many elegant and useful editions of Sanscrit works that you have prepared, or the still more numerous dissertations on Hindū literature and antiquities, on the religious sects of this peninsula, and other kindred subjects, with which your indefatigable research has enriched the memoirs of this Society, as well as some other literary repositories of India and England. One of these, however, which heads the 15th volume of our own Transactions, is of too important a nature to be passed over without distinct mention. In the intricate labyrinth of Indian history and chronology, where the erudite labours of Jones, of Hamilton, and of Wilford, seemed only to render the darkness visible, and the confusion more hopelessly inextricable, furnishing too just ground for the idea that, in India, mythology and pantheistic mysticism had swallowed up history altogether—you have discovered one point at least, where order could be educed from the chaos of existing materials—where conclusions satisfactory to sound historical criticism could be attained—from which, as way-marks, the future investigator might safely proceed in exploring what is elsewhere most doubtful in this vast undiscovered region of Asiatic antiquity. That this is a correct judgment of your “*Essay on the Hindū History of Cashmīr*,” the voice of continental critics, some of them most conversant with the philology of Central Asia, will unite with ours in attesting. And, after the casual mention of one eminent deceased scholar of this Society, whose

life was spent in scanning the contents of the Mahábhárata and Puránas, and comparing them, often hastily and fancifully, with the results of an uncommonly extensive and recondite western reading, we cannot fail to notice the far more useful as well as more critical, labour, which you have bestowed on those huge treasures of Hindú mythology and tradition. Of the first and most classical of these poems, you are about to give a splendid Sanscrit edition to the public. But your analysis of the contents of this, of the 18 Puránas, and several Upapuránas, with translations interspersed of the most curious and interesting portions of each, is a work of which the literary merit, and importance to all future inquirers into Hindú fable or history, can scarcely be estimated too highly. It is indeed unpublished: but the 20 folio MS. volumes containing it, hold a most distinguished place among the many valuable gifts for which the library of this Society is indebted to you. We cannot but indulge the hope, that the older and far more difficult monuments of Hindú antiquity, the Védas, may hereafter receive that illustration from you which no other scholar, with the exception perhaps of Mr. Colebrooke, is fully competent to afford them.

Hitherto it is in reference to Sanscrit studies only, or the dialects immediately connected with it, that we have considered your unrivalled claims to our gratitude, and that of the literary world: but it will not have escaped the attention of any one acquainted with the works alluded to, the History of Cashmír especially, how well you have availed yourself of the collateral assistance, which the accurate knowledge of *other* Eastern languages has supplied. In the great work which you gratuitously undertook of arranging and describing the very large unformed collections of that indefatigable traveller and antiquary, the late Colonel Colin Mackenzie, you had to apply that knowledge to a variety of interesting objects *separately*. And, in the full description of the result of this six years' labour, which you published in Calcutta in two octavo volumes in 1828, a work in which Sanscrit books and monuments hold the chief, but by no means the only place, every reader must admire the happy critical attention which your active mind could bestow on so many objects, each sufficient to engross the attention of an ordinary scholar, collected from such various quarters, and comprised in so many difficult languages.

It cannot but enhance greatly the admiration with which we view these illustrious contributions to the stock of Asiatic learning, when we consider, that your time, from your first arrival in the country, has been occupied in official duties of an important and difficult character, totally unconnected with literature: and that the severe scientific studies of your own profession also (in which your merits have been recently acknowledged by those most competent to estimate them) have not, amidst this double distraction, been neglected. Nor can we but be greatly struck with the fact, that amidst occupations so various, so arduous, and so honourable, you could undertake the province (which inferior minds might have been delegated to perform, though they could not have performed so well,) of preparing elementary works in English for the instruction of Hindú youth, and even devoting a large portion of your time to the active superintendence of their yet infant seminaries of education. Still more, when we find, that from a complication of employments sufficient to distract or overwhelm the mass even of clever men, your mind could not only unbend itself in the lighter departments of elegant literature and art, but find ease and diversion in the hardness of statistical



inquiries, and the details of recent political history. Your work on the Commerce of Bengal, lately published, and your History of the Burmese war, must remain signal monuments of the rare vigour of your enlightened and accomplished understanding.

But we must return finally to your relation to the Asiatic Society, and that not merely as a member, and unequalled contributor to its stores, but as its Secretary. From the time when you succeeded the late Dr. Hunter in that important capacity in 1810, not only have your main services been thus identified with the progress of oriental learning, and conspicuous to the whole literary world, but have been displayed in matters of which we alone are witnesses, and which we only can acknowledge: the arrangement of our papers, the preparation of the Transactions for the press, the compilation of a useful index to the whole, the conduct of all the details of the Society's business—in all which your attention and devotion to our interests has been most constant and exemplary. Nor must we omit to mention the masterly manner in which you have conducted the extensive correspondence, domestic and foreign, of this Society; nor the characteristic amenity of manners with which you have been ever ready to assist with your valuable aid and counsel the President and other individual members. None, after Sir W. Jones, if even he is to be excepted, has stronger claims on our grateful recollection; none certainly more long continued ones. During the last 23 years, you have never quitted your place amongst us, except only that year (1820), when you were absent on Government duty at Benares—an absence which, while it enabled you to fulfil more perfectly many of your learned undertakings, could not fail to reflect the greater honour on the Society.

For these eminent and unequalled services, we feel that the best thanks we can offer are but an insignificant recompense. We can only add to this tribute of mere justice to your past merits, our warmest hopes and wishes for the future, that you may fill, with increased honour and happiness, the distinguished station which a munificent founder has established in one of our ancient universities. We trust that you may succeed in awaking in many of the British youth, destined to important stations here, a desire to acquire that knowledge of the Sanscrit language and literature by which you are yourself so immortally distinguished, and thus become the means of extending to this land the blessings of increased civilization and Christianity.

But one wish remains for ourselves. We wish not to be without some durable monument of the great talents which have, for nearly a quarter of a century, given strength, and activity, and honour to our meetings in this place. We therefore request, that you will add to your former favours this one, of permitting your bust to be taken by the most eminent sculptor in England, at the charge of this Society: that it may stand in our room as an enduring testimony of the high esteem and respect with which your memory will be ever cherished by the Asiatic Society.

EDWARD RYAN,  
President."

Dec. 31st, 1832.

At the conclusion of this address, Mr. Wilson, having requested the President and Members to be seated, replied in the following terms :

"When I recollect, that Mr. Colebrooke, on leaving India, received from the Asiatic Society, of which he had for many years been the chief ornament and support, no other tribute than an official letter from myself, the tenor of which was left very much to my own discretion, I cannot but feel ashamed of the vastly inferior claims which have been this day honoured by you with such highly favourable notice. If he received less, I have reaped more than I am entitled to, and I have to thank you not only for the commendations which I might in fairness claim, but for your kindness and partiality, the not unnatural growth of many years of association, which have suggested this overflowing measure of reward for any service I may have rendered to the Society.

"I shall not pretend to disclaim the warm interest which I have taken in the credit and prosperity of the Asiatic Society, from the period of my first arrival in this country, or in the researches which it was instituted to promote. After I became a Member, the Secretary of the Society, to do so was no more than my duty; but it was equally my pleasure and pride to be a member of a body established for such honourable and useful purposes as the investigation of man and nature in the East, the development of the past history and present condition of these vast and important regions, and the maintenance of the British character for enlightened and liberal research, and the disinterested cultivation of intellectual pursuits. The share that I may have borne in the accomplishment of these purposes has made many hours of my leisure in this country glide happily away; to have been associated in them with so many excellent and talented individuals, has always been, and must always be, a subject of self-congratulation; to have earned such an estimation amongst them, as they have this day expressed, must ever be a source of proud and grateful recollection.

"In consenting to the request with which you have been pleased to conclude the flattering enumeration which you have made of my services to Oriental Literature and to the Society, you will acquit me, I am sure, of being influenced by merely personal feeling. If I can judge of your sentiments by my own, I can fully appreciate the motives which induce you to seek to preserve memorials of those who have taken an active part in the labours of the Society. One of the most interesting decorations of the room in which we are accustomed to assemble is to me, to all, the portrait of our illustrious founder; and I am sure you will agree with me, that the apartment would possess a still dearer interest were such decorations multiplied—did the countenances of Colebrooke, Wilford, Wilkins, and other distinguished members look down complacently upon the labours of their successors. I need not add, how irresistible are such influences upon the human mind, and how well calculated are such memorials to give a wholesome stimulus to youthful energies. It is not from a merely selfish motive, therefore, that I accede to your request, but in the hope, that even in this way I may contribute, however feebly, to the great ends of our Institution. At the same time I am not insensible of the kindness which has prompted the proposal, and if I do feel vain, it is that you should have thought me worthy of the honour of being perpetually, as far as any thing human is perpetual, present amongst you.

"Gentlemen, I have only further to bid you farewell, and offer you my most fervent hopes for the continued activity of the Asiatic Society, confident, that that alone is necessary to insure it continued and increasing utility and reputation."



*Proceedings of the Indian Committee of the British Association for the Promotion of Science.*

In virtue of a resolution of the General Committee of the British Association on the 3rd March, 1832, the Rev. W. V. Harcourt, Vice-President, in the Chair, the following gentlemen were appointed a Local Committee in India, to co-operate in the objects of the Institution—Sir Edward Ryan, Mr. George Swinton, Mr. James Calder, Major Benson, Captain J. D. Herbert, Dr. Turnbull Christie, (since dead,) and Mr. James Prinsep.

A first meeting of the resident members of this Committee was held at the house of Mr. Swinton, on the 3rd October, when Sir Edward Ryan kindly undertook the office of President, and Mr. J. Prinsep that of Secretary. Mr. Swinton signified the assent of Major Everest, Surveyor General of India, to become a member of the Committee, and stated that he had addressed circulars to the members absent from Calcutta, together with printed copies of the first report received from the Rev. Mr. Harcourt. On the 14th Nov. a second meeting was held at the house of Sir Edward Ryan, when it was resolved to submit an application to the Government, for permission to borrow from the Surveyor General's office such Barometers and other Meteorological instruments as he might be able to spare, for distribution to those gentlemen who may volunteer to prosecute the inquiry into atmospherical phenomena on this continent, so urgently recommended to the attention of the Indian Committee by the Association. With reference to this subject, a letter from Dr. T. Christie\* acquainted the meeting, that the Madras Government had strenuously taken up the subject of meteorology, and had at his recommendation sent to England for twenty complete sets of the best instruments, to be distributed among observers on the peninsula; and had caused to be printed, at the Government Lithographic Press, a note of instructions, with tables and forms of registers, prepared by himself.

Captain Herbert's reply to the circular from Mr. Swinton pointed out, that he had been for some time engaged in investigating the theory of the wet bulb thermometer, and that he hoped soon to be able to throw some light on that simple form of hygrometric instrument.

Mr. Prinsep stated, that he was already in possession of one or two good series of meteorological observations, and had every expectation of soon possessing a valuable mass of such information.

## IX.—EUROPEAN SCIENTIFIC INTELLIGENCE.

### 1.—*New Nautical Almanac.*

The Report of the Nautical Almanac Committee is printed in the 2d part, vol. IV. of the Memoirs of the Astronomical Society. Their suggestions have been adopted throughout by the Admiralty, and are ordered to take effect from 1834. We extract the appendix to the report, which gives a clear view of important im-

\* Whose lamented death we reported in our last.

provements to be introduced, sufficiently intelligible to all engaged in astronomical pursuits without further explanation.

Those articles which are now introduced for the first time, are printed in *italics*; and the same mode is adopted to denote the alterations which have been made in the *extension of the computations* of the other articles.

“The use of *apparent* time to be abolished in all the computations, except in those immediately connected with the sun's transit.

The day of the week, repeated as often as convenient.

———— month, on every page.

———— year, (or days elapsed since Jan. 1st) in numerical order.

*The fractional part of the year, for every such day.*

Equinoctial time for every day in the year.

*Mean time of the transit of the first point of Aries to two places, for every day.*

SUN'S	{	R. A. in time (with <i>hourly motion</i> ) to 2 places,	} At the time of Sun's transit.
	{	Declination (ditto ———) to one place,	
	{	Siderial time of $\frac{1}{2}$ diam. passing mer. to 2 places,	

Equation of time (with hourly differences) to 2 places.

SUN'S	{	<i>Right ascension, to two places.</i>	} At mean noon.
		<i>Declination, to one place.</i>	
		<i>Longitude, to one place.</i>	
		<i>Latitude, to two places.</i>	
		<i>Semidiameter, to one place.</i>	
		<i>Siderial time, to two places.</i>	

*Equation of time, to two places.*

Logarithm of radius vector, to seven places.

MOON'S	{	<i>Longitude, to one place.</i>	} For noon and midnight.
		<i>Latitude, to one place.</i>	
		<i>Horizontal parallax, to one place.</i>	
		<i>Semidiameter, to one place.</i>	
		<i>Mean time of transit, to the tenth of a minute.</i>	

Age to the *tenth* of a day for noon.

AR. in time, to two places, } For every hour.

Declination to one place,

———— with differences for five minutes.

Phases, to the *tenth* of a minute,

Perigee and apogee for the nearest hour, } For each lunation.

PLANETS, viz. Mercury, Venus, Mars, Jupiter, Saturn, Herschell,	{	<i>Heliocentric Longitude, to one place,</i>	} For every day at noon.
		———— <i>Latitude, to one place,</i>	
		<i>Logarithm of radius vector to seven places,</i>	
		<i>Geocentric AR. in time, to two places,</i>	
		———— <i>Declination, to one place,</i>	
		<i>Long. distant from the Earth, to seven places,</i>	
		<i>Mean time of transit, to the tenth of a minute,</i>	
		<i>Horizontal parallax, to two places,</i>	
		<i>Polar semidiameter to two places,</i>	} For every fifth day.

PLANETS, viz. <i>Vesta,</i> <i>Juno,</i> <i>Pallas,</i> <i>Cercs.</i>	$\left. \begin{array}{l} \text{Heliocentric Longitude,} \\ \text{--- Latitude,} \end{array} \right\}$		$\left. \begin{array}{l} \text{To the nearest minnte,} \\ \\ \\ \end{array} \right\}$	$\left. \begin{array}{l} \text{For every fourth} \\ \text{day at noon.} \end{array} \right\}$
	Geocentric AR. in time, to the tenth of a minute,			
	- - - - - declination to the nearest minute,			
	Radius vector, to four places,			
	$\left. \begin{array}{l} \text{Long. distance from the earth, to four places,} \\ \text{Mean time of transit, to the tenth of a minute,} \end{array} \right\}$		$\left. \begin{array}{l} \text{For one month before} \\ \text{and after opposition at} \\ \text{midnight.} \end{array} \right\}$	
	Geocentric AR. in time, to two places,			
	- - - - - Declination, to one place,			
	Radins vector, to five places,			
	$\left. \begin{array}{l} \text{Long. distance from the Earth, to five places,} \end{array} \right\}$			

The co-efficients A B C D, for every day, at midnight.

JUPITER'S SATELLITES	{	Eclipses of { in mean and siderial time, to one place.	} To the nearest minute.
		diagrams for shewing the place at that time.	
		Contact with the planet, in siderial time,	
		Contact of shadows with the planet, in do.	
	{	Configurations.	
LUNAR DISTANCES	{	From the Sun and the nine principal	
		Fixed Stars, and from Venus, Mars,	
		Jupiter and Saturn, for every third hour.	
		With the proportional logarithm of the differences, annexed.	

Apparent obliquity of the ecliptic, to two places,	} For every day.
Parallax of the Sun, to two places,	
<i>Aberration of the Sun, to two places,</i>	
Equation of equinoctial points, in Longitude, to two places,	
_____ in R A to two places,	
Mean longitude of the moon's node, to the tenth of a minute,	

ECLIPSES	$\left\{ \begin{array}{l} \text{Solar, with the line of the moon's umbra, diagrams, \&c.} \\ \text{Lunar,} \end{array} \right.$	

*Predicted occultations (visible at Greenwich) of planets and fixed stars to the sixth magnitude inclusive, in mean and siderial time, to the nearest minute; with the angle from the vertex, and also from the most northern point of the moon's disc.*

*Elements for predicting such occultations of the planets and fixed stars to the fifth magnitude inclusive, as may be visible in any habitable part of the globe, with the limits of latitude annexed.*

*The apparent places of the stars on the days of occultation to be given in both cases.*

*Apparent places of the fixed stars (100 in number) for their time of transit:  $\alpha$  and  $\delta$  Ursæ minoris for every day, the remainder for every tenth day, with differences annexed:*

*Mean places of the same at the beginning of the year in a separate list.*

*A list of moon-culminating stars, continued within four days of new moon: the apparent AR. of the stars to two places, and the mean declination to the nearest minute; also the*

MOON'S	{	AR. in time, of her bright limb, to two places,	}	For upper and lower culmination.
		<i>Variation in ditto for one hour of longitude,</i>		
		Siderial time of semidiameter passing meridian, to two places,		
		Declination, to nearest minute, for upper culmination.		

A LIST OF PHENOMENA, containing,	{	Conjunctions (in of AR.) the planets with	{ the moon. certain fixed stars. each other.	
		with difference of declination to the nearest minute.		
	{	time when the planets are	in quadrature.	
			in conjunction.	
			in opposition.	
			in their perihelion.	
			in their aphelion.	
			in their nodes.	
		{	stationary.	
			at their greatest heliocentric latitude.	
			at their greatest elongation (with amount).	
	{	time when the sun is in	{ Perigee. Apogee.	
		time of the greatest brilliancy of Venus.		
		time of the maximum and minimum of the light of variable stars.		
		time of the maxima of the moon's libration.		
Notice of	{	transits of Mercury.		
		predicted comets.		
		any other remarkable phenomena.		
Elements for finding	{	the geocentric appearance of Saturn's ring.		
		the illuminated portions of the discs of Venus and Mars.		
TABLES	{	for the correction of 2nd differences in lunar distances.		
		for determining the latitude by the pole star out of the meridian.		
		of the longitude and latitude of the principal observatories.		
		of the time of high water at London bridge.		
		for finding the time of high water at the principal ports.		
	{	of Errata discovered in logarithms and other tables of repute.		
		Notice of newly determined positions, magnetic variations, &c. &c.		
		Preface, to contain an account of all the tables used in every computation; and		
		a notice of any equations omitted, or new corrections applied.		
		Cycles, remarkable days, moveable feasts, law terms, &c. to be prefixed.		
		Table of Contents.		

(Signed) J. SOUTH, President.

## 2.—Heated Air and Uncoked Coal for smelting Iron Ore.

The journals have lately announced the discovery in France of a method of smelting iron ore with billets of wood uncoked, from which a great saving of expense is anticipated. This discovery will prove of high utility to the iron smelters in foreign countries, especially in the north of Europe: but to the British smelters, it is vastly inferior in importance to the process now employed at the Clyde Iron Works, by which iron of an excellent quality is obtained at once and in much larger quantity than formerly, by the employment of raw uncoked coal. The agent in this remarkable amelioration of the smelting process is *heated air*, with which the blast in the furnace is kept up, instead of the cold air hitherto propelled into the furnace; the iron when withdrawn is much more fluid than



when smelted by the old process, and in this respect has much resemblance to the Silesian iron of the first fusion. The value of this happy application in an economical point of view may be seen from the following circular drawn up by the patentee.

“Comparative view of the quantity of materials required at Clyde Iron Works to smelt a ton of foundry pig-iron, and of the quantity of foundry pig-iron smelted from each furnace weekly :

	Coals. tons.	Iron- stone. cwts.	Lime- stone. cwts.	Weekly produce in pig- iron. tons.
1, with air not heated and coke, .. . . . . .	7	3 $\frac{1}{2}$	15	45
2, with air heated and coke, .. . . . . .	4 $\frac{1}{2}$	3 $\frac{1}{2}$	10	60
3, with air heated and coals, .. . . . . .	2 $\frac{1}{2}$	3 $\frac{1}{2}$	7 $\frac{1}{2}$	65

Note. 1. To the 2nd and 3rd lines there must be added five cwts. of small coals required to heat the air, in iron pipes, carried several times through the oven, so that the air may arrive at the furnace at a heat of between 600 and 700 ; it should melt lead at three inches from the orifice.

2. The expence of the apparatus is from £200 to £300 for each furnace.

No coals are now used at the Clyde works : and we learn that Messrs. Jessop and Co. at the Butterly works, have successfully adopted the same plan. The furnaces are blown by a double-powered steam-engine, with a steam cylinder 40 inches in diameter, and a blowing cylinder of 80 inches, which compresses the air so as to carry 2 $\frac{1}{2}$  lbs. per square inch. The muzzles are 3 $\frac{1}{8}$  inch in diameter. EDIN.  
JOUR. XII.

### 3.—Price as measured by Money.

Political economists have been reproached with two small a use of facts, and too large an employment of theory. If facts are wanting, let it be remembered, that the closet-philosopher is unfortunately too little acquainted with the admirable arrangements of the factory ; and that no class of persons can supply so readily, and with so little sacrifice of time, the data on which all the reasonings of political economists are founded, as the merchant and manufacturer : and unquestionably, to no class are the deductions to which they give rise so important. Nor let it be feared, that erroneous deductions may be made from such recorded facts : the errors which arise from the absence of facts are far more numerous and more durable than those which result from unsound reasoning respecting true data.

The great diminution in price of all articles within these few years may have arisen from several causes :

1st. *The alteration in the value of the currency.* 2nd. *The increased value of gold, in consequence of the increased demand for coin.* The first of these causes may have had some influence : and the second may have had a very small effect upon the two first quotations of prices, but none at all upon the two latter ones. 3rd. *The diminished rate of profit produced by capital however employed.* This may be estimated by the average price of three percents. at the periods stated. 4th. *The diminished price of the raw materials, out of which these articles were manufactured.* The raw material is principally brass and iron, and the reduction upon it may, in some measure, be estimated by the diminished price of iron and brass wire, in the cost of which articles the labour bears a less proportion than it does in many of the others 5th. *The smaller quantity of raw material employed, and perhaps, in some instances,*



an inferior quality of workmanship. 6th. The improved means by which the same effect was produced by diminished labour.

In order to afford the means of estimating the influence of these several causes, the following table is subjoined :—

Average Price of	1812	1818	1824	1828	1830	1832
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£
Gold per oz. ....	4 15 6	4 0 0	3 17 6½	3 17 7	3 17 9½	3 17 10½
Value of currency per cent. ....	79 5 3	97 6 10	100	100	100	100
Price of 3 per cent. consols. ....	59¾	73¾	93½	86	89¾	82½
Wheat, per quarter....	6 5 0	4 1 0	3 2 1	3 11 10	3 14 6	2 19 3
English pig iron at Birmingham.....	7 10 0	6 7 6	6 10 0	5 10 0	4 10 0	„
English bar iron at do. „	„	10 10 0	9 10 0	7 15 0	6 0 0	5 0 0
Swedish bar iron in London, excluding duty of from £4 to £6 10s. per ton....	16 10 0	17 10 0	14 0 0	14 0 0	13 15 0	13 2 0
Hard-ware manufactured.....	100	on an	average	reduced to		40
	s. d.	s. d.	s. d.	s. d.	s. d.	
Anvils per cwt.....	25 0	20 0	20 0	16 0	13 0	
Locks for doors, 6-inch, per doz.	38 0	32 0	15 0	13 6		
Iron wire, No. 6. ....	16 bund.	13 0	9 0	7 0		
Brass wire.....	1b.	1 10	1 4	1 0	9	

The most influential of these causes has undoubtedly been the invention of cheaper modes of manufacturing. The extent to which this can be carried, and yet a profit be realized at the reduced prices, is truly astonishing, as the following fact, which rests on good authority, will prove. Twenty years since a brass knob for the locks of doors was made at Birmingham, the price, at the time being 13s. 4d. per dozen. The same article is now manufactured, having the same weight of metal, and an equal or in fact a slightly superior finish, at 1s. 9¼d. per dozen. One circumstance which has produced this economy in the manufacture is, that the lathe on which these knobs are finished is now turned by a steam engine; so that the workman, relieved from that labour, can make them twenty times as fast as he did formerly.—*Babbage's Economy of Manufactures.*

#### Death of M. Jacquemont.

We regret to learn from the newspapers, that Monsieur Victor Jacquemont, the distinguished Naturalist, who was travelling through India on the part of the Académie of Paris, died at Bombay on the 7th instant. He commenced his tour through India at Calcutta in 1829: he proceeded through the Jungle Mehals to Benares; thence to Rewah and Bundelkhand; and through the Doab to the Hills; whence, after obtaining permission, through the intervention of the Governor General, from Maharaja Ranjit Singh, he pursued his journey into Kashmír, and even penetrated a short distance within the limits of the Chinese territory. He returned across the continent to Bombay, where a lingering affection of the liver, brought on by constant exposure to severities of climate, put a period to his existence. Mon. Jacquemont had never communicated the results of his researches to any one of his many friends in India, but we know that he had been most actively employed, and we shall look anxiously for an account of all he has done, in the French scientific journals.

# Meteorological Register, kept at the Surveyor General's Office, Calcutta, for the Month of December, 1832.

Days of the Month.	Minimum Temperature observed at sunrise.				Maximum Pressure observed at 9h. 50m.				Max. Temp. and Dryness observed at 2h. 40m.				Minimum Pressure observed at 4h. 0m.				Observations made at Sunset.				Observations at 10½ P.M. in Calcutta.							
	Barometer reduced to 32°.	Temp. of the air.	Depres. of the air.	Wind.	Aspect of the sky.	Barom. red. to 32°.	Temp. of the air.	Depres. of the air.	Wind.	Aspect of the sky.	Barom. red. to 32°.	Temp. of the air.	Depres. of the air.	Wind.	Aspect of the sky.	Barom. red. to 32°.	Temp. of the air.	Depres. of the air.	Wind.	Aspect of the sky.	Barom. red. to 32°.	Temp. of the air.	Depres. of the air.	Wind.	Aspect of the sky.			
1	30.004	61.5	0.1	cm.	cl.	.051	73.3	5.5	n. e.	cl.	.929	82	11.7	n. e.	cl.	.928	80.5	11.5	n.	ci.	.929	77	7.0	cm.	cl.	72.2	75	
2	.973	61.5	0.5	do.	do.	.027	74	5.5	s. w.	do.	.908	83.3	11.8	s. w.	do.	.898	82	11.2	s. w.	cl.	.907	76.7	6.2	do.	do.	72.2	76	
3	.963	65.5	0.5	do.	do.	.020	77	7.0	n.	do.	.920	84.5	11.0	n.	do.	.913	82.7	11.7	n.	cl.	.919	77.3	6.0	do.	do.	73.0	76	
4	.991	62	0.5	do.	do.	.047	76	6.3	cm.	do.	.950	80.3	13.6	n. w.	do.	.932	82	12.0	n. w.	do.	.945	77	7.5	do.	do.	73.0	76	
5	.002	65.3	2.6	do.	do.	.071	74.3	6.8	n.	do.	.960	80	12.6	do.	ci.	.954	79	11.5	do.	cl.	.971	75	6.7	do.	do.	68.3	8.0	
6	.041	60.5	1.5	do.	do.	.087	71.7	7.4	do.	do.	.990	77.7	12.0	n.	cl.	.986	76.3	11.5	n.	cl.	.991	75.7	10.7	do.	do.	69.0	7.1	
7	.008	58.5	1.5	do.	do.	.063	70.3	6.6	n. w.	do.	.932	77.7	13.4	n. w.	do.	.933	75.7	11.4	n. w.	do.	.933	72	4.7	n. w.	do.	68.3	8.0	
8	.957	58.3	1.8	do.	do.	.030	73.2	8.7	do.	do.	.916	76	11.0	do.	do.	.913	75.7	11.2	n.	do.	.918	72	6.4	cm.	do.	67.0	7.0	
9	.972	58	1.0	do.	do.	.043	70.3	6.3	n.	do.	.906	77.7	11.7	n.	do.	.903	75.7	15.2	do.	do.	.917	69	3.0	do.	do.	68.5	5.1	
10	.980	59	0.7	do.	do.	.053	71.5	6.2	n. e.	do.	.931	78.5	10.0	n. w.	ci.	.930	76	10.0	do.	ci.	.967	65.7	1.0	n. w.	do.	71.3	7.5	
11	.992	59	1.0	do.	do.	.029	73.8	6.8	n. w.	do.	.909	79.5	10.5	do.	cl.	.960	77	10.0	do.	cl.	.965	66.7	5.7	cm.	do.	67.2	5.2	
12	.991	61.7	0.7	do.	do.	.045	70.7	5.1	do.	do.	.940	79	9.0	do.	do.	.939	78.7	9.0	do.	cl.	.967	65.7	1.0	n. w.	do.	71.3	7.5	
13	.996	61.5	3.5	do.	ci.	.071	72	5.3	n.	do.	.971	72.5	11.5	do.	do.	.962	71.8	11.1	n.	do.	.965	66.7	5.7	cm.	do.	64.5	9.7	
14	.987	54	1.0	do.	do.	.031	68	9.0	n. e.	do.	.932	74	10.5	n.	do.	.919	73	10.0	n. w.	do.	.951	70	7.0	do.	do.	65.2	7.4	
15	.985	57	2.0	do.	do.	.044	71.3	7.3	cm.	do.	.922	76	9.0	s. w.	do.	.913	75.2	7.2	n.	do.					do.	63.0	5.3	
16																										do.	64.4	5.3
17	.035	65	0.3	e.	cus.	.073	75	6.0	e.	cn.	.953	80	10	n. w.	cus.	.952	78	7.0	cm.	cus.	.951	75.5	5.5	n. e.	do.	69.2	4.4	
18	.929	61.5	0.5	n. w.	ci.	.060	70.5	4.5	n. w.	cl.	.928	78	9.3	do.	ci.	.911	77	10.0	n. w.	cl.	.913	75	8.3	n. w.	do.	69.5	5.4	
19	.951	60	2.5	n. e.	do.	.003	69	9.0	n. e.	cus.	.902	73	4.0	e.	cus.	.894	73.5	9.0	n. e.	do.	.886	72	8.0	n.	do.	68.5	7.5	
20	.926	56	2.0	do.	do.	.070	68.5	9.8	do.	cl.	.941	74	12.5	n.	cl.	.935	71	11.5	n.	cl.	.944	70	11.0	n. w.	do.	66.3	5.7	
21	.903	53	2.0	do.	do.	.030	66	10.3	do.	do.	.920	73	15.0	n. w.	do.	.907	71.5	13.8	do.	do.	.908	70.5	12.5	n.	do.	63.4	10.2	
22	.961	52	1.5	s. e.	ci.	.078	64	7.5	n.	do.	.853	72	12.3	do.	do.	.858	71	11.0	do.	do.	.855	69	9.5	do.	do.	63.3	8.7	
23	.935	55.5	3.0	n. w.	do.	.025	64	6.0	do.	do.	.944	64	11.3	n. w.	ci.	.936	73	11.5	n. w.	do.	.939	70	10.0	n. w.	do.	62.6	7.4	
24	.888	54	2.0	n.	ci.	.946	67	5.0	do.	cus.	.834	76	13.0	do.	cl.	.831	71	9.0	do.	ci.	.854	74	10.0	n.	do.	64.8	7.4	
25	.892	55	2.5	do.	cl.	.942	62.5	2.0	do.	cl.	.843	78.7	14.7	n.	do.	.846	72	7.5	n.	cl.	.841	75	10.0	do.	do.	64.8	8.0	
26	.953	58.5	2.5	do.	do.	.021	70	11.5	do.	do.	.913	75.7	10.7	do.	do.	.913	75	11.5	do.	do.	.910	72	10.0	do.	do.	67.1	8.4	
27	.947	53	4.5	do.	do.	.108	61	9.5	do.	do.	.978	70	14.3	n. w.	do.	.968	69.7	14.2	n. w.	do.	.949	67.3	12.3	do.	do.	64.8	10.8	
28	.062	51.5	5.5	do.	do.	.085	61	7.3	do.	do.	.011	71	12.5	do.	do.	.985	70	12.0	do.	do.	.983	69	11.3	do.	do.	63.0	8.4	
29	.932	54	4.5	n. w.	do.	.065	63.5	8.5	do.	do.	.003	69.7	11.2	do.	ci.	.989	71.5	13.0	do.	ci.	.978	69	11.0	do.	do.	62.0	8.4	
30	.975	50	1.5	n.	ci.	.153	64	9.0	n. w.	do.	.059	73	14.5	n.	do.	.033	71.5	13.5	do.	cl.	.044	66	7.0	do.	do.	60.2	8.7	
31	.119	53	1.5	do.	cl.	.102	62.5	12.5	n.	do.	.006	69.5	15.0	do.	do.	.092	69.5	14.5	do.	do.	.090	67	12.3	do.	do.	62.0	6.5	
Mean,	.998	55.8	1.6			.045	69.2	7.1			.939	76.3	11.6			.931	74.9	11.1			.939	71.6	8.1			65.9	7.3	

Abbreviations. In the column "wind," small letters have been used instead of capitals; *cm.* means calm. In the column "aspect of the sky," *cy.* is cloudy; *cl.* clear; *rn.* rain; *ci.* cirrus; *cu.* cumulus; *cs.* cirro-stratus; *cus.* cumulo-stratus; *cc.* cirro-cumulus; *n.* nimbus.

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